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**Original Communications.**

ARTICLE I.

VACCINATION. By HENRY M. LYMAN, M.D., Professor of Physiology and of Diseases of the Nervous System, in Rush Medical College, Chicago, Ill.

It is very evident that much obscurity of thought regarding the origin and nature of vaccination still lingers in the minds of physicians. This is largely owing to the fact that a considerable period of time divides us from the epoch which was marked by the publication of Jenner's great discovery, so that many of the facts which were then widely known have now been nearly forgotten. But it is, perhaps, even more to be attributed to the circumstance that the principal authorities who have guided professional opinion were themselves ignorant of numerous facts which have been recently brought to light, and which serve to co-ordinate and to illuminate all previous observations. Hence it cannot be a matter of reproach that inadequate and erroneous opinions regarding this subject have been entertained by many fairly educated men, since even so eminent an author as Sir Thomas Watson, only a few months ago, found himself obliged, after reading Mr. Ceely's papers, which, though published forty

years previously, had never before attracted his attention, to retract his life long utterances regarding the nature of bovine virus. The recent researches of Pasteur and of his companions, regarding bacterial infection, have also contributed greatly toward the solution of the mystery which, in the minds of many, seemed to invest the whole subject of protection against small-pox by vaccination. We are now, however, in a position to form a clear idea regarding a subject, in connection with which there is no longer any place for mystery.

The opinion was long entertained vaguely by many physicians that small-pox and vaccinia were entirely distinct, though similar, diseases. This belief was based upon the fact that Jenner did not himself fully comprehend the manner in which these two forms were related. He believed that they were identical in their origin, but he did not demonstrate that identity. It was his opinion that horse-pox infected the cow through the intervention of the hands of the stable-boy who attended both animals, but he did not establish the origin of the horse-pox. It was only when the experiment of variolating the cow with the virus of small-pox had been successfully performed that the fundamental identity of variola and vaccinia was demonstrated. This was first performed, in 1801, by Gasser, of Günsberg (Seaton, *Reynolds' System of Medicine*, Vol. I., p. 176, Am. Ed.) Inoculating eleven cows with small-pox virus, he produced on one of them vesicles bearing all the character of vaccine vesicles, and from them a stock of genuine vaccine lymph was obtained. The same experiment (*loc. cit.*) was performed, in 1802, at the Veterinary College at Berlin. Mr. Ceely, of Aylesbury, in England, was equally successful in 1839. In 1840 (*loc. cit.*) Mr. Badcock, of Brighton, succeeded in procuring genuine vaccine virus by variolation of the cow; and he met with equal success on thirty-seven subsequent occasions.

It has also been shown that cattle can be variolated by inoculation of the volatile exhalations of variolous clothing, etc., but this is of rare occurrence.

Another significant fact deserves mention in this connection. Since the general adoption of vaccination, the vaccine disease has almost entirely ceased to occur in the cow. Previous to the in-

roduction of vaccination, when small-pox was one of the domestic pestilences, it was an exceedingly common thing to find cows suffering with the vaccine eruption upon the udder. It was never observed upon the bull. Nor was it discovered upon the cow, except during the period of lactation, when subjected to handling. This indicates that variola is not a primary bovine disease, but is communicated from the human sufferer to the lower animals. The identity of variola and of vaccinia (so far as their origin is concerned), and the dependence of cow-pox upon previous human small-pox may therefore be considered a demonstrated fact. Cases like that of the Beaugency heifer may be most probably explained by supposing that they originated in an infection communicated by the hand of a variolous tramp, or of some other milker who was the unsuspected bearer of the virus of small-pox.

The above mentioned experiments and observations also place in bold relief the fact that the manifestations of variola may be exceedingly varied by the conditions of their occurrence. The phenomena of inoculation for small-pox had taught this lesson long before the discovery of Jenner; and the varieties of post-vaccinal small-pox have illustrated the same thing ever since. Few diseases are more easily varied by external conditions. Thus we have discrete, confluent, and hæmorrhagic small-pox, post-vaccinal small-pox or varioloid, bovine small-pox, and vaccine disease—all springing from one common source. It is true that the identity of *variola vacciniæ* and human small-pox has been denied by Fleming and by others; but I think no unprejudiced person can read Ceely's original papers without coming to the same conclusion that was realized by Sir Thomas Watson, when he for the first time perused them, a few months ago—that they are actually one and the same disease, only modified by the different environments in which they occur. This experimental proof also corresponds with the deductions derived from observation of the protective effect of vaccination. There is no other example of immunity against any particular disease acquired by experience of some other disease. Scarlet fever protects against scarlet fever, measles against measles, typhus fever against typhus fever, small-pox against small-pox. If, then, vaccine

disease protects against small-pox, every analogy goes to show that it protects because it is, indeed, itself, only a form of small-pox. As long as we allowed ourselves to consider it a separate disease, it was impossible to refute the argument of the homœopathist, who quoted vaccination as an example of a disease being remedial against another *similar* disease. Like cures, or rather, prevents, like in this case; therefore the law *similia similibus curantur* must be true. Such was the argument, and it could not be successfully attacked by those who held to the dual nature of these diseases. But when we accept the evidence of experiment in the variolation of cows, we can reply to the homœopathist: This is no case of like and like. Small-pox protects only against itself. Variolæ vacciniæ and variola are radically and essentially the same disease, and the one must necessarily protect against the other by reason of their actual identity.

It was not, however, until the recent experiments for the protection of animals and fowls against anthrax and chicken cholera, that all difficulty was removed from consideration of the problem. Pasteur, Toussaint, and others, in France and Germany, found that by *attenuating* the virus of chicken cholera, and by heating the blood or other liquids of anthrax, a dilute form of the specific poison was produced, which, when injected into a healthy animal, excited a modified, and generally non-fatal form of the disease, by which the animal was completely protected against the fully virulent form of the contagion. Here, then, we find an explanation of the manner in which the virus of bovine variola differs from the virus of human variola—it is variolous virus attenuated, diluted or modified by the action of the bovine tissues, so that, while it does not excite the general eruption of variola in the human subject, it does yet, when used for vaccination, so sufficiently modify the human tissues that they become tolerant of the fully virulent poison of unmodified human small-pox.

It follows, therefore, that we have in the variolation of the cow an ever-present method of originating fresh supplies of vaccine virus—a method which in time of need is much more reliable than the search for accidental cases of sporadic cow-pox, both because of the danger of confounding cow-pox with vaccinella, a puerperal eruption of the cow which has no relation whatever



with small-pox, and because of the great rarity of genuine sporadic cow-pox in these days of limited prevalence of human small-pox. The discredit which some have sought to throw upon this method of producing vaccine virus grows out of ignorance of the fact that the virus yielded by the pustule of a freshly variolated cow is exceedingly energetic. It is so active that Watson and others long supposed that it was merely the original variolous matter transplanted back again from the cow to the human subject. Ceely found that it produced such acute symptoms that it was necessary to attenuate it by several successive human vaccinations before it was sufficiently moderate in its effects to be used with comfort. Such virus sometimes produces an actual eruption, closely simulating varioloid; but after a few successive vaccinations it becomes so far "humanized"—that is, *attenuated*—that it only occasionally causes such general disturbance. Sometimes, however, as I have this past winter observed, after the use of bovine virus, we get an eruption of numerous vesicles around the point of vaccination. In one instance I observed an attempt at general eruption, which, had it occurred after the use of virus from a freshly variolated cow, might have been mistaken by an ignorant person for an aborted variolous exanthem. Similar eruptions after the use of bovine virus are mentioned by all the writers on vaccination; and they would no doubt be more frequent if the original bovine virus (Beaugency, or other stock) had not been already diluted by numerous successive calf-inoculations before it reached the profession.

The superior value of bovine virus for purposes of vaccination is now fully established by the results of accurate observation in England and Europe. It was foreseen by thoughtful men very soon after the announcement of Jenner's discovery, that the protective influences of vaccination must necessarily diminish with the progress of time; but the enthusiastic advocates of vaccination would not listen to any such opinions. For a number of years, in fact, the protection against small-pox seemed to be almost perfect. But a quarter of a century had not elapsed before it was remarked that post-vaccinal small-pox was becoming frequent. It was ascertained, at length, that by multiplication of the points of vaccination a greater degree of immunity was con-

ferred. For a long time insufficiency of vaccination was claimed as the cause of post-vaccinal small-pox. But as years passed on, it was found that multiplication of marks, though better than single puncture, was becoming diminishingly protective. At the same time, the mortality of small-pox in unvaccinated persons was also gradually increasing. The following table is given by Dr. Cameron (*Fortnightly Review*, May, 1881):

Percentage of mortality in small-pox in persons showing	1836-51	1852-67	1870-79
Cicatrices of vaccination .....	6.9	7.6	9.2
" 1 .....	9.2	14.8	13.65
" 2 .....	6.0	8.7	10.14
" 3 .....	3.6	3.7	7.4
" 4 or more .....	1.1	2.0	4.88
" 1 or 2 .....	7.9	11.5	10.29
" 3 or more.....	2.4	2.8	5.8
Percentage of mortality in small-pox, or in unvaccinated persons.	37.5	35.7	44.6

During the earlier years of the century the mortality from post-vaccinal small-pox did not exceed one per cent. It has gradually increased, with temporary abatements, caused by improved hospital accommodation, treatment, etc., but on the whole, steadily increasing.

The causes of this result are two-fold: One great cause lies in the gradual loss of the protective influence of hereditary tolerance which had been acquired by an indefinitely long period of exposure to small-pox. This subject I have elsewhere discussed (*The Medical Record*, June 26, 1880, p. 720). The other causes which we at present have to consider, consists in the gradual modification of vaccine virus itself by repeated transmission to healthy subjects. In England, whence the above statistics are derived, vaccination is performed with human lymph, the greater part of which has descended directly from the original bovine virus introduced by Jenner. In other words we have here the results of a series of "culture experiments," in which bovine

virus has been for many generations cultivated in the liquids of successive healthy human bodies. We find in these cultivations a regular progress toward a result analogous to the result of successive cultivations of the *bacillus anthracis* in healthy fluids outside of the animal. Gradually the bacillus loses its infective energy, until at length it becomes utterly innocuous, like the harmless hay-bacillus from which, by appropriate management, it was originally transformed. This process is evidently going on in the case of English vaccine virus. At its present rate of progression it is not difficult to estimate approximately the period necessary to reduce such virus to a condition of non-protective inertia. The bovine virus which we now use in this country has not yet had time to degenerate appreciably; but there is no reason to suppose that its course, whether cultivated in the body of the calf, or in the body of the human infant, will vary from the course of Jenner's original bovine virus in England.

The only sufficient remedy for this deterioration consists in occasional reversions to the original product of the variolated cow. By a few subsequent calf cultivations, this can be sufficiently attenuated for human use; and thus the original protective power of vaccination, so far as energy of the virus is concerned, may be maintained. Of course this cannot in any way compensate for that loss of hereditary tolerance of small-pox which is steadily progressing.

One more lesson we may learn from these observations. It is evident that small-pox is a disease which does not prevail among us as a direct transmission from some indefinitely remote first case of variola. It must necessarily be continually originating, *de novo*, in some part of the world. Were this not the case, small-pox, by reason of constantly progressive dilution, attenuation, or modification, of its virus by successive cultivation in the bodies of the healthy, would long since have lost its virulent character, and would have ceased to exist. We are justified in the adoption of this conclusion by what may be observed in any protracted epidemic of the disease. As Marson remarked, long ago, such epidemics cease not so much by reason of a lack of unaffected individuals in a community, as by reason of causes which he was not then in a position to explain. A sufficient ex-

planation of the fact may be found in the diminishing energy of variolous virus by reason of frequent transmission through the bodies of healthy individuals. Just as the virulent energy of the *bacillus anthracis* diminishes, and finally disappears, as a result of its cultivation in successive portions of a healthy cultivating fluid, so the variolous virus finally loses so much of its virulence during the course of an epidemic that, though capable of producing the typical phenomena of small-pox as long as it produces any effect, the newly formed virus becomes less and less capable of maintaining its specific existence, and *dies out*, as we say.

It is true that we might not be at liberty to draw this conclusion from observation of variolous epidemics alone; but such observations, taken in connection with what we now know regarding the fate of a certain definite body of variolous virus—the modified Jennerian bovine virus, studied in England during the present century—enable us to arrive at certain definite scientific conclusions of the highest importance.

I am well aware that the revivification of variolous virus which takes place whenever it is transported to a virgin soil in a susceptible population, seems to contradict the hypothesis of its deterioration by transmission from person to person. This seeming contradiction, however, is more apparent than real. If, by mere transplantation, a virus could be restored to its original degree of energy, every virulent disease should long since have become everywhere endemic within its own climatic zone; and it should now be impossible to trace the march of any epidemic. Instead of this, we can trace the course of small-pox on lines which always radiate from an oriental, endemic focus where there is every reason to suppose that the disease is continually arising, *de novo*, as a result of special local reactions between man and his environment.

## ARTICLE II.

LARYNGEAL TUMORS. Report to the Illinois State Medical Society by E. FLETCHER INGALS, A.M., M.D., Lecturer on Diseases of the Chest and Physical Diagnosis, and on Laryngology, Rush Medical College; Professor of Diseases of the Throat and Chest, Woman's Medical College, Chicago, May 18, 1881.

Less than a quarter of a century has elapsed since the discovery of the laryngoscope removed the diagnosis and treatment of diseases of the throat from the field of empiricism, and placed it among the most exact specialties of our art.

No more striking illustration of the benefits that have accrued from a knowledge of laryngoscopy can be found than that which is contained in the history of laryngeal growths.

For twenty-five hundred years preceding the year 1857, not more than seventy cases had been recorded, where either antemortem chance or post-mortem investigation had, by the discovery of a morbid growth, revealed the true nature of many obstinate and fatal cases of laryngeal disease. Since the experiments of Czermak and Türk many of these growths have been discovered; hundreds of patients have been relieved, and many have been rescued from death by the removal of tumors which would otherwise have caused strangulation. Nearly every variety of morbid growth which may affect the human body has been discovered in the larynx, but the great majority of intra-laryngeal tumors are of a papillary character. Probably ninety-seven or ninety-eight per cent. of all these growths are benign in nature.

Of all laryngeal tumors the papillomata constitute about seventy-five per cent.; the fibromata about twelve per cent., and fibro-cellular growths about five per cent. Of the remaining, the greater part are cystic, and after these, in the order of their frequency, come the sarcomata and lipomata, together with rare instances of mucoid, vascular or adenoid growths, and finally cancers. Of primary cancer it has been my misfortune to see three cases.

Morbid growths in the larynx are found most frequently in males; they may occur at any age, but between the ages of twenty and forty, they are more common than at either extreme of life. Of my own patients, the youngest was six years old and the oldest seventy.

Excepting the malignant growths, these tumors are generally the result of chronic catarrhal inflammation of the larynx, of a mild character. They are occasionally caused by syphilis, and not infrequently by phthisis. In some instances measles, croup, diphtheria, whooping-cough, or the inhalation of irritating substances seem to have acted as exciting causes.

The symptoms caused by these growths, depend mainly upon their location and size, and are much the same regardless of the exact nature of the tumor. The patient usually gives a history of having had a severe cold, contracted several months beforehand, from which he has never fully recovered. There has generally been some hoarseness at first, which has at times been better and at times worse, until finally it has become persistent; but in some cases the aphonia continues paroxysmal for a long time. The hoarseness may progress to complete aphonia, and if the tumor is large, considerable dyspnoea may be experienced. The affection of the voice is often most marked with small tumors, especially if they are attached to the vocal cord. Often these patients complain of a tickling sensation in the throat, and when the tumor is pedunculated they frequently experience sensations like those produced by a foreign body in the larynx.

The growth seldom causes much pain, but frequently it gives rise to slight discomfort, especially on swallowing. If the tumor is of considerable size the difficulty in deglutition may be very marked. Even with small growths, speaking is often tiresome, and with the larger it may be nearly impossible, either from the impediment to the free vibration of the cords or from lack of force in the expiratory current of air.

Respiration is often stridulous when the tumor is large. Cough is usually present, but it varies greatly in character and frequency. It may be harsh and dry, or easy and loose, and it is sometimes croupy. In some cases there is scarcely any cough, while in others this may be the most distressing symptom. With



small neoplasms the expectoration is usually slight, but with the larger growths, whether benign or malignant, it is frequently excessive. In these latter cases collections in the larynx of tenacious mucus greatly add to the suffering and danger of the patient. This mucus may cause great difficulty in respiration and doubtless in cases which are not properly treated it is often the immediate cause of death.

*Diagnosis.*—By auscultation over the larynx or trachea a moist râle or sort of valvular murmur may sometimes be detected, but even if all the ordinary symptoms and signs of a tumor are discovered, an accurate diagnosis cannot be made without the laryngoscope.

By the aid of a small mirror, placed in the throat, and a good light reflected upon it, we can usually at once determine the nature of the difficulty; though in some cases the intractability of the patient or the peculiar location of the tumor may necessitate repeated examinations.

*Prognosis.*—The prognosis in cases of benign laryngeal tumors depends upon their size and location. If a tumor is small and located above the vocal cords it may give the patient no particular inconvenience, but if situated on the cord it causes more or less aphonia.

Tumors as large as a pea usually cause aphonia, even though located above the vocal cords.

The tendency with most of these growths is to gradually increase in size, though some of them, after attaining a certain size, may remain stationary for years.

When a tumor has once caused hoarseness there can be no reasonable hope for the disappearance of this symptom until the growth has been removed.

Large growths, by which I refer to tumors varying from the size of a pea to that of a filbert, often jeopardize the patient's life. They may do this by exciting and rendering permanent a harassing cough which may gradually exhaust the patient; or, in consequence of the small size of the glottis they may so interfere with respiration as to cause sudden death by choking, or more gradual dissolution through the deleterious effects of continuous imperfect aëration of the blood; or their pernicious effects may be mainly due to the difficulty which they cause in deglutition.

Malignant tumors in the larynx, so far as past experience goes, are fatal. Treatment may prolong life for a few days or months, but a time will soon come when deglutition or respiration will become impossible, and then tracheotomy or even extirpation of the larynx can add only a brief span to the patient's existence.

*Treatment.*—There are two plans of treating benign laryngeal tumors. First, that calculated to relieve the local hyperæmia, and, second, that for the destruction or removal of the growth.

A few laryngologists discourage all operative procedure so long as the growth does not materially interfere with the individual's means of obtaining a livelihood, or directly endanger life; and these believe that the sole treatment in many cases should be that adapted to chronic laryngitis; for example, the topical application of strong mineral astringents or mild caustics.

While this treatment is undoubtedly adapted to some cases, it should be accorded a secondary place. It is often useful as an adjunct to operative measures, but it will seldom effect a cure. I have seen tumors considerably diminish in consequence of the persistent use of such remedies, but they have soon attained their original size when the treatment was suspended, or even during its continuance. In some cases I have no doubt that such treatment stimulates the tumor to more rapid growth.

Notwithstanding the difficulties and dangers of operative procedures, I am fully in accord with those laryngologists who believe that, as a rule, benign growths in the larynx should be removed by operative measures. This should be accomplished through the natural passages when possible; and when this is impracticable, if the growth endangers life, it must be removed by tracheotomy, by thyrotomy, by supra-thyroid laryngotomy, or by division of the thyro-hyoid membrane, or by infra-thyroid laryngotomy.

However, extra-laryngeal methods should not be adopted even when endo-laryngeal methods cannot be carried out, unless the patient's life is endangered by the presence of the tumor.

Most of the papillary growths found in the larynx are not larger than a pea, but occasionally they attain the size of a walnut. They are generally multiple. These tumors are usually

attached to the vocal cords, to the ventricular bands, or to the inter-arytenoid fold. They may be pedunculated, but they are more apt to be sessile.

Most papillomatous tumors of the larynx are of a light pinkish color, and have a granular surface or are laminated like condylomatous growths. They are soft and friable, so that they may be easily crushed or pulled off with forceps. Voltolini has shown that they may occasionally be detached by frequent up-and-down movements of a sponge passed into the larynx.

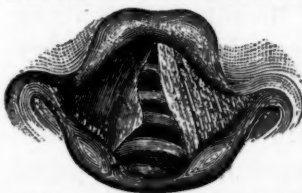
Tumors of this kind are not likely to recover after they have been thoroughly removed, excepting in phthisical patients.

As has been stated, papillomata constitute about three fourths of all laryngeal tumors, and their immediate cause is a chronic hyperæmia of the mucous membrane from which they spring.

To illustrate the earlier stages of their growth, I will cite three cases of chronic laryngitis, in which the circumscribed swelling of the mucous membrane indicates the beginning of what may ultimately become a well defined tumor.

#### OUT-GROWTHS.

CASE I. *Out-growths from the vocal cord.* J. K., æt. 50, laborer. This patient came to me about a year ago, complaining of hoarseness and severe cough. The lungs and heart were found to be healthy. Laryngoscopic examination revealed general diffuse inflammation of the mucous membrane of the larynx.



After a few astringent applications the patient passed from my observation. About three months ago he returned with much the same symptoms as at first. During the interim he had been sometimes near-ly well, and sometimes quite hoarse. At this time I found the larynx greatly congested, and the vocal cords red and thickened. Upon the free edge of the right cord, about its middle, was an outgrowth of a conical form, the apex of which projected about four millimeters into the rima-glottidis (Fig. 1.) The base of this swelling extended six or eight millimeters along the free edge of the cord.

This case illustrates the origin of many laryngeal growths. At first there occurs chronic catarrhal inflammation of the part, which is followed by an excessive proliferation of cells in the sub-epithelial connective tissue, which finally results in a morbid growth supplied with new blood-vessels, and covered with an attenuated epithelium. The tumor thus formed may be single, but more often is made up of numerous papillæ, each of which may give off secondary or tertiary offsets, which give to the whole mass a strawberry-like or cauliflower appearance. The former occurs when the epithelial covering encloses the whole mass, the latter when it is insufficient to fill the spaces between the papillæ.

In cases of this kind the proper treatment consists of frequent applications to the larynx, by means of a brush, of some strong astringent, such for example, as: Argenti nitras, gr. xl—lx *ad* aquam ℥i; zinci sulphas, gr. xxx—lx *ad* aquam ℥i; zinci chloridum, gr. xx—xxx *ad* ℥i, or liq. ferri per chlorid., min. xv—xxx *ad* aquam ℥i. At the same time sedative inhalations or internal remedies may be needed to relieve cough. In addition to these, benefit will sometimes be derived from stimulating inhalations which may be employed by the patient at his home.

In the case of this patient I have obtained the best results from applications of sulphate of zinc, gr. xxx *ad* ℥i, and the internal use of bromide of potassium with small doses of belladonna. Inhalations could not be employed. His visits have been irregular and the treatment has been correspondingly unsatisfactory; but the congestion has been much relieved, the prominence on the vocal cord has been considerably reduced in size, and the voice is correspondingly improved.

Case II. *Incipient laryngeal tumor.* J. S., æt. 43, printer.

When this patient first consulted me he had been hoarse for six months. He had been troubled most of the time with cough, but his general health had been good until a few weeks before I saw him.

Inspection of the larynx revealed swelling of the mucous membrane just beneath the right vocal cord at its posterior extremity (Fig. 2.) The prominence extended along the side of the larynx

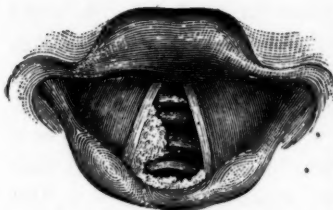


Fig. 3.—Incipient laryngeal tumor.

which was visible.

Treatment.—Astringent applications were made with the laryngeal brush and by the insufflator, and tonics were given internally.

The patient was soon obliged to discontinue his attendance at my office on account of his work, so that the effects of treatment could not be demonstrated.

CASE III. *Subglottic œdema, resulting from chronic laryngitis, and having the appearance of incipient tumors.* W. T., æt. 65, farmer. The patient stated that he first had trouble with his throat twenty-nine years ago, as the result of measles. At that time hoarseness lasted two years. About eight years later hoarseness again returned and continued troublesome for several years. He has had repeated attacks of eczema for twenty years, and for the past eighteen months has suffered from it constantly. When the patient consulted me he was very hoarse and complained of some dyspnoea on exertion, and of constant though slight sore throat.

Upon laryngoscopic examination I found the right ventricular band so much swollen that it nearly hid the right vocal cord. The mucous membrane below the anterior extremity of the left cord, and that below the posterior extremity of the right cord were swollen so as to present the appearance of morbid growths, and to considerably interfere with respiration. The condition of the throat was apparently due to the same cause as the inflammation of the skin.

#### PAPILLARY GROWTHS.

CASE IV. *Papilloma of larynx.* P. S., æt. 28, butcher. This patient stated that about three years before consulting me he had several attacks of sore throat which left him with hoarse-

for nearly a centimeter, and stood out beyond the vocal cord about four millimeters. The mucous membrane covering the laryngeal side of the inter-arytenoid fold presented a notched and yellowish gray appearance, strongly suggestive of ulceration below the part

ness which had been constantly present for two years. I could obtain no history of either phthisis or syphilis. The lungs and heart were normal.

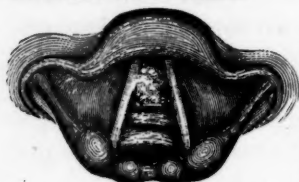


Fig. 3. Papilloma on right vocal cord.

Laryngoscopic examination revealed a tumor about the size of a large pea, on the right vocal cord near its anterior extremity. The tumor was of a light red color; it had a slightly granular surface and it was attached to the free edge of the cord by a large pedicle.

At the first sitting I removed, with common laryngeal forceps, about half of the growth, and at the second sitting, three days later, I removed all that remained and cauterized the base with the solid nitrate of silver. To prevent inflammation I directed the application to the neck of hot applications, which were to be continued as long as there was any soreness of the larynx. At the patient's next visit, three days later, the vocal cords were still congested. Soreness of the larynx had lasted but a few hours after the operation. At this time I applied to the cords a stimulating solution of chloride of zinc gr. v. *ad.* aquam  $\mathfrak{z}$ i, and ordered bitter tonics to correct some gastric disturbance.

The patient was not seen again for a month; at that time the voice was perfect in ordinary conversation, but not reliable for singing. The vocal cords were still of a pink color. I then applied a solution of sulphate of zinc, gr. xx. *ad.* aquam  $\mathfrak{z}$ i, and ordered the daily use of a spray from a four-grain solution of the same remedy. About six weeks later the patient came again to my office, when I found the vocal cords of a natural color and the cure complete.

CASE V. *Tumor of the left ventricular band.* J. S. M., æt. 28, physician. When this gentleman consulted me he had been troubled with hoarseness for several months. An examination revealed chronic inflammation of the pharynx with a highly congested state of the larynx.

The left vocal cord was nearly hidden from view by the swollen ventricular band, and on the posterior half of the same band I discovered a sessile growth of a light color, ovoid in form,



about six millimeters long, and projecting about three millimeters from the surface.

The patient's throat was too irritable for immediate operation, and as he was obliged to leave the city the same evening, nothing was done. I have not seen him since, but he informs me by letter, that his throat seems in the same condition, and that he has done nothing for it.

CASE VI. *Papilloma of larynx.* Mrs. B. S., æt. about 25. Ten years ago this patient was nearly suffocated in consequence of laryngeal tumors. These were removed by Prof. Wm. Bruns, of Tübingen, and according to the patient's statement, the larynx was thoroughly cauterized with nitrate of silver and the galvano-caustic. Afterward the patient had no more trouble until a few months since, when she began to complain of a sensation as of a bolus in the throat.

Upon examination of the larynx, I discovered a small, semi-transparent growth at the anterior end of the right vocal cord. This was about four millimeters in length, by two or three in breadth, and it protruded from the upper surface of the cord about two millimeters. A papillary growth was also found on the inner side of the upper part of the left arytenoid cartilage.

The smaller growth I destroyed by the solid nitrate of silver. The larger I removed with forceps, and then thoroughly cauterized its base with solid nitrate of silver.

The removal of the tumor, in this case as in most others, caused little pain; but the caustic was very painful. Hot fomentations were directed to be kept constantly applied to the neck, for from twenty-four to thirty-six hours, or until all soreness had disappeared. In this patient the papillæ at the base of the tongue were much enlarged, and they doubtless had something to do with the sensation of a foreign substance in the throat. This case illustrates the occasional tendency of papillomatous growths to repullulation.

CASE VII. *Papilloma of larynx.* A. J., æt. 39, machinist. This patient stated that he had been more or less hoarse for three months before coming to see me. He had never had syphilis and had no knowledge of a hereditary predisposition to consumption. He occasionally had slight pain on swallowing

and he sometimes suffered from choking spells. I found the patient's digestive organs in good condition; he was well nourished and had no fever. His lungs and heart were healthy. Upon examining the larynx I found the epiglottis congested, but not swollen; the arytenoids slightly swollen, and the vocal cords slightly congested. A large papillary growth about seven millimeters in breadth by five millimeters in altitude, and one and one-half centimeters in length, occupied the laryngeal side of the inter-arytenoid fold and hung between the cords.

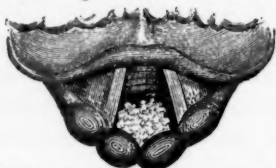


Fig. 4. Papilloma on inter-arytenoid fold.

This tumor though as large as an ordinary raisin, was completely hidden during phonation, and owing to the pendant position of the epiglottis it could seldom be seen at other times. Owing to difficulty in getting this patient to inspire easily and thus expose the growth, I thought it advisable not to attempt its removal until by topical applications the congestion of the parts had been partially relieved and the larynx had become tolerant of instruments.

Only a few applications were made to the larynx when the patient discontinued his visits to my office, but he has lately returned, and I have on two occasions introduced forceps into the larynx, but I have not yet been able to reach the growth. Although this tumor hangs very low in the larynx, I expect to seize it as soon as manipulation renders the patient's throat a little more tolerant.

CASE VIII. *Papilloma on under surface of epiglottis.* E. C., æt. 24; brick manufacturer. Two years before calling on me this patient had pneumonia in the upper lobe of the right lung, and he had been subject to frequent attacks of intermittent fever. Three months before consulting me he had an attack of pleurisy from which he recovered, but ever since he had been troubled with sore throat and hoarseness. The latter had been most annoying in the morning. He had been very much troubled at night with cough though there has been only a small amount of mucus expectorated. When I first saw him he had slight pain at intervals on deglutition, and, in consequence of

this pain and broken rest, had lost six or seven pounds during the last twelve weeks. I found that he had never suffered from specific disease, and none of his relatives so far as known, had died of consumption. The apex of the right lung showed slight evidence of consolidation, but there was no dullness on percussion.

Upon examining the larynx, I found an omega-like epiglottis, swollen to twice its normal thickness, with a small spherical papillary growth about six millimeters in diameter on its under surface near the vocal cords. The ary-epiglottic folds were thickened and slightly pyriform in shape, and the whole inner surface of the lower half of the epiglottis, of the anterior end of the ventricular bands, and of portions of the true cords, had a granular appearance with here and there erosion of the mucous membrane. From the respiratory sounds and the appearance of the larynx, I made the diagnosis of laryngeal phthisis.

Treatment: The larynx was penciled with a solution of morphia, gr. iv, carbolic acid, gr. xxv, and tannic acid, gr. xxx, in equal parts of glycerine and water sufficient to make one ounce. This had the effect of relieving pain, of giving immunity from cough at night and thus securing rest, and of somewhat reducing the swelling of the larynx. The papilloma was removed with forceps and the larynx was touched three or four times with solid nitrate of silver.

At the end of the first week the patient was directed to inhale the compound tincture of benzoin, morning and evening (ʒi, to aq. Oi, at 150° F.) He was subsequently given cod liver oil. The local applications to the larynx were continued as at first with the substitution now and then of a solution of chloride of zinc, gr. xv to ʒi of water. I find the following notes in my case-book after two weeks of treatment: pulse 104, temperature 100° F.; appetite fair and cough moderate; patient has gained three pounds in flesh.

At this time he returned to his home in Indiana, with the advice that he continue the inhalations and cod liver oil, and as soon as practicable make a change of climate. I have recently learned from my friend Dr. Cassidy, of South Bend, Indiana, that this patient shortly after returning to his home went to Austin,

Texas, where he died quite suddenly about four months later. The immediate cause of death could not be ascertained.

CASE IX. *Tumor on right vocal cord.* R. D., æt. six years. I learned that this little patient had been apparently perfectly healthy since he was two months old, but three months before he was brought to me his voice began to fail, and at the time I saw him there was complete aphonia, the patient being unable to talk except in a whisper. After considerable difficulty, arising from the intractability of the patient, and a pendent epiglottis, I obtained a view of the larynx, which revealed congestion of the cords and a small sessile tumor near the middle of the right vocal cord on its free edge. (Fig. 5.) There appeared to be some growth below the cord but it was impossible to make a satisfactory examination. As there was no dyspnœa an operation did not seem advisable.



Fig. 5. Tumor on right vocal cord.

In cases like this, operative procedures are not advisable unless, from increase in the size of the growth, dyspnœa should become marked, then tracheotomy should be performed. Then, if the tumor cannot be removed through the mouth, thyrotomy is likely to become necessary. Internal remedies may be of service in lessening the congestion of the mucous membranes and in retarding the growth of the tumor, and astringent or slightly stimulating inhalations should be employed for the same purpose.

#### FIBROMATA.

Fibrous tumors of the larynx are usually of small size and are generally located on the vocal cords; sometimes, however, they attain the size of a cherry. They may be attached to other parts of the larynx.

These growths are usually rounded in outline, single, and pedunculated, but they may be nodular as though made up of several tumors bound together by an investing membrane, and they are sometimes sessile.

They are usually of a grayish white or red color. They grow slowly, and when once removed have no tendency to return. One of these tumors, which I treated, was developed under my

own observation, in a young lady affected with slight catarrhal laryngitis. The history of the case is as follows:

CASE X. *Fibrous tumor of left vocal cord.* Miss D. H., æt. 22. This patient came to me complaining of hoarseness, which, as determined by a laryngoscopic examination, was caused by simple catarrhal inflammation of the larynx. Her general health was good, and after being treated a few days, her voice was so much improved that she discontinued her visits and did not return for several months. This time I found a small fibrous growth attached to the free edge of the vocal cord near its anterior extremity. (Fig. 6.)

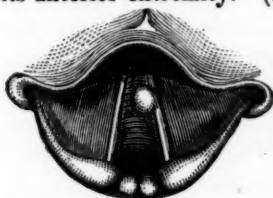


Fig. 6. Fibroma of left vocal cord.

Astringent applications were made to the larynx from time to time for several weeks, with the effect of relieving the inflammation of the parts surrounding the growth, and at times apparently reducing the size of the tumor itself; but notwithstanding the apparent improvement, the tumor grew until it reached the size of a small pea. I then attempted its removal by means of Mackenzie's tube forceps. The throat was very sensitive at first, and it was not until after numerous sittings that I succeeded in grasping the tumor, and then, owing to its firmness, only a part of its mucous covering was removed. I immediately seized the growth again and crushed it as thoroughly as possible between the blades of the forceps. The patient was then sent home with instructions to guard against taking cold, and to return in four days. The operation caused but little pain.

On her next visit, there was still some swelling of the vocal cord, but the tumor had disappeared. There was still hoarseness, but the voice was improved. The patient experienced some pain in swallowing, the evening after the operation, but this disappeared in a few hours.

When I saw her again, two months after the operation, all swelling of the cord had disappeared, and she informed me that the voice had been perfect for several weeks.

CASE XI. *Tumor of the larynx apparently fibroid.* Mr. J. M., æt. 63. Upon consulting me this patient stated that his

voice had been weak for six or seven years; he had been troubled more or less with hoarseness for four or five years and for the past three years he had been constantly hoarse. For three months he had been troubled with dyspnoea, and for the last three weeks all the symptoms had been aggravated. The difficulty in speaking seemed mainly due to deficient force of the expiratory current of air. On laryngoscopic examination a large pyriform growth was found immediately beneath the vocal cords; against which it was pressed in phonation. (Fig. 7.)



Fig. 7. Sub-glottic tumor of larynx.

The tumor was of a pale-pink color, was about eight millimeters in diameter, and was attached to the anterior surface of the larynx by a large pedicle. An operation was recommended but the patient declined to have the growth interfered with, stating that

he had lived with it for several years and thought he could do so several years more.

#### FIBRO-CELLULAR TUMORS.

Fibro-cellular tumors are sometimes classed as soft fibromata. They are rare. They grow slowly, but may attain a large size. When removed they have no tendency to recur. They consist of delicate fibro-cellular structure, the interstices of which are filled with fluid or semi-solid granular matter containing nucleated cells. One small growth of this character has fallen under my observation, and I have treated another which seemed to me of the same nature, though I could not be certain in the diagnosis. In both cases, the notes of which are given below, I removed the tumor.

CASE XII. *Small fibro-cellular growth on anterior extremity of right vocal cord.* Mrs. L. S., æt. 20. This patient came to me complaining of slight hoarseness and inability to use the voice for more than a few minutes at a time. She also noticed, occasionally, a slight dull pain in the throat. The difficulty dated from a slight cold fifteen months previously.

Upon examination of the larynx I found the epiglottis hanging so far back as to render it difficult to expose the anterior extrem-



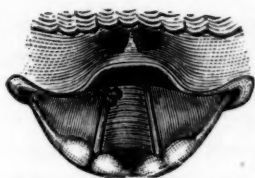


Fig. 8. Tumor on right vocal cord.

ities of the vocal cords; but during the phonation of a high-pitched *a*, I could see a small growth on the free edge of the right vocal cord, about four millimeters from its anterior end. This growth was about the size of a hemp seed, sessile and made up of three

small nodules. (Fig. 8.)

The growth was removed with Mackenzie's tube forceps. Three days later no trace of it remained excepting slight congestion of the vocal cords; and in ten or twelve days the cure was complete, the voice having regained its normal condition. Over two years have now elapsed without any return of the laryngeal trouble.

CASE XIII. *Small sessile fibro-cellular tumor on left vocal cord.* Mr. E. B., aged 30. When I was first consulted, this patient had been slightly affected with nasal catarrh for about three years, and had been troubled with hoarseness for several months. I

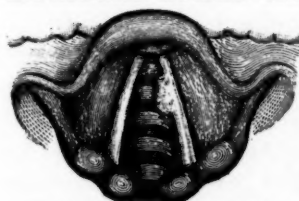


Fig. 9. Tumor on left vocal cord.

found a sessile tumor on the lower surface and free edge of the left vocal cord, about two millimeters from its anterior extremity. (Fig. 9.) The growth was about five millimeters in length, and projected about two millimeters beyond the free margin of

the cord. The mucous membrane of the post-nasal space and of the pharynx was considerably relaxed.

This patient's throat was so sensitive that several sittings were necessary before instruments could be tolerated. Astringents were applied at each sitting, and finally the tumor was removed with Mackenzie's common laryngeal forceps. Ten days later no trace of the growth could be seen, and in about six weeks the voice was perfectly natural.

#### CYSTIC TUMORS.

Cysts are seldom found in the larynx. Those which have been observed have generally sprung from the epiglottis or from one of the ventricles. They may attain a large size.

Contrary to what would be expected from our knowledge of other retention cysts, these tumors are not likely to return if they are thoroughly laid open, their contents emptied out, and the cavity cauterized with solid nitrate of silver.

CASE XIV. *Cystic tumor.* Mr. B., æt. 20. The only growth of this kind with which I have met, occurred in the larynx of a young farmer who could not remain in the city long enough for operative procedures. The patient had been hoarse for several months but was not troubled with cough or dyspnoea. A laryngoscopic examination revealed a small cystic growth, about eight millimeters in diameter at the posterior extremity of the right ventricular band.

The patient's throat was too sensitive for immediate operation, and, as he was obliged to return to the country on the following day, no effort was made to open the cyst.

#### CANCER OF THE LARYNX.

In the early stages of cancer of the larynx the diagnosis is often doubtful, as at this time the symptoms due to the laryngeal tumor are not usually different from those caused by benign growths, and often the essential cachexia does not present itself. Pain, dyspnoea and dysphagia are often present, but these symptoms vary greatly in different cases according to the seat, size, and condition of the growth. Fauvel states that at first the pain is confined to the larynx and that it does not radiate to the ears until ulceration takes place.

In one of my cases the acute, burning pain commencing in the larynx, radiating to the upper part of the pharynx, and later, to the right ear and right side of the head, together with the presence of a large nodular tumor involving the ventricular band, ary-epiglottic fold and epiglottis, left no doubt as to the nature of the case. But, in the other cases, nothing either in the symptoms and general condition of the patient, or in the physical appearance of the growth enabled me to make an exact diagnosis. In these cases at first the physical appearance of the growth was so much like that of an ordinary papilloma that only a microscopical examination by an experienced pathologist could determine its true nature. Even then the fact that many tumors of the larynx which have had a malignant appearance to the mi-

croscopist, have had a benign history and course, induced me to hope that these might possibly be of a benign character; however, in both instances the subsequent history has justified our worst misgivings.

For cases of laryngeal cancer there can be but one prognosis, as thus far all that have been reported, with three exceptions one of which was probably non-malignant at first, have died within a few months after the disease became developed sufficiently to cause the patient to seek advice. Mackenzie states that the usual duration of epithelioma of the larynx is about eighteen months, and of encephaloid three years.

The forms of treatment which must be considered in cases of laryngeal cancer are: removal through the natural passages and thorough cauterization of the base of the growth; tracheotomy; thyrotomy; and extirpation of the larynx.

In cases where there is a well defined tumor, of doubtful character the first of these methods seems preferable; but when the growth is not well defined and when it springs from the sub-mucous tissues, or where it involves a considerable portion of the larynx, this method cannot effect its complete removal, therefore, one of the other methods must be tried if anything is done.

Tracheotomy will usually add several months to the patient's life, and has prolonged it in some cases for two years.

Thyrotomy.—The results of thyrotomy with removal of the growth have been very unsatisfactory. In some cases where this operation has been attempted, it could not be completed; in others the patients have died in a few days, and in nearly all of the remaining cases the growth has speedily returned.

Extirpation of the larynx may be practiced in suitable cases, but it is an operation attended with great danger, in which, as stated by Dr. P. Kock, "The skill of the surgeon is, in some cases, shown by the patient not dying under his knife." I find records of twenty cases in which this operation has been performed. Of these, eight died in from two to fourteen days; one in six weeks, and in eight the disease returned and proved fatal in a few months. Of the three remaining cases one died of phthisis a year and a half after the operation; and in the other two there has been no return of the affection.

All things considered, when endo-laryngeal treatment cannot be successful, tracheotomy seems to hold out the greatest encouragement to both surgeon and patient; but even this in most cases should not be strongly urged by the surgeon as at best it can only add a few months to a miserable existence. One of the arguments used in favor of the removal of cancers which can be easily reached is, that when they return they may affect some vital organ and thus terminate the patient's life without prolonged suffering. If this argument was applied to cases of cancer of the larynx even tracheotomy would never be advised.

CASE XV. *Cancer of larynx.* S. P., æt. 69. This patient came to me complaining of hoarseness and great dyspnœa. The former had lasted eighteen months, the latter had been present six weeks.

Upon examination a large growth was found on the right side of the larynx apparently springing from the ventricular band, and extending along its whole length. About three-fourths of the glottis was obstructed by this tumor. (Fig. 10.)

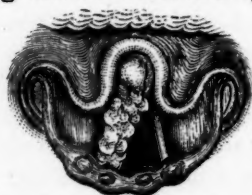


Fig. 10. Cancer of larynx.

Owing to an omega-like epiglottis and to difficulty in getting the tongue sufficiently out of the mouth, I had great difficulty in obtaining a good view of the growth, and subsequently I found even greater difficulty in introducing forceps for its removal.

At one of the first sittings a portion, the size of a large pea, was removed and submitted to Prof. Danforth for microscopic examination. He pronounced it a semi-malignant growth likely to return. Several sittings were necessary before the tumor was entirely removed. At the end of six weeks my notes state that although the growth had been removed the patient complained of great weakness; for which he was given tonics. Three weeks later I was called to see him at his home. He was greatly prostrated, and, on examination of the larynx, I found a swelling about the size of a filbert, which had the appearance of an abscess of the right ventricular band. This was incised freely with laryngeal lancet two or three times with the effect of materially reducing its size though no pus escaped. Subsequently fungoid

granulations sprang up and grew so rapidly that in two or three days they nearly stopped the glottis. These were removed every second or third day for about two weeks. At that time the sub-mucous tissues became involved more extensively and the obstruction of the larynx could not longer be relieved by forceps.

After consultation with Drs. H. A. Johnson and E. Ingals, it was decided that no considerable relief could be afforded without tracheotomy.

The case was fully explained to the patient but he hesitated about the operation, and death terminated his sufferings about thirty-six hours later.\*

CASE XVI. *Cancer of larynx.* P. N., æt. 59, laborer. Four months before consulting me, this patient began to have slight burning pains in the throat, on deglutition. Shortly afterward these pains frequently occurred at other times, and finally they became nearly continuous, with frequent exacerbations. The pain began in the lower part of the larynx from which it would dart to the upper part of the pharynx, and finally to the right ear and the right side of the head. Hoarseness had been present for nearly four months. At this time the patient's appetite was fair and the general health seemed as good as usual. He did not suffer from dyspnœa when quiet excepting while lying down.

An examination of the larynx revealed a large nodular growth about two centimeters in diameter which involved the right ventricular band, the right arytenoid cartilage and ary-epiglottic fold and about one-fourth of the right side of the epiglottis. (Fig. 11.) The tumor hid the posterior four fifths of the glottis

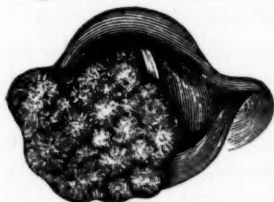


Fig. 11. Cancer of larynx.

from view, but the anterior extremities of the vocal cords appeared healthy. The diagnosis of cancer was made and an unfavorable prognosis given; which so discouraged the patient that he sought more favorable opinions from other physicians. Two months later I was called to see this patient at his home. The growth had then ulcerated and great destruction of

\* This case was at first supposed to be non-malignant, and was reported as such to the Chicago Medical Society.

the upper parts of the larynx had occurred. The patient was extremely weak, was suffering greatly, and was unable to eat. He had failed rapidly in the last two weeks. Anodynes were given and the friends informed that the end was near.

I have been unable to learn the subsequent history of this case.

CASE XVII. *Cancer of larynx.* R. S., æt. 53, farmer. Tumor on left ventricular band. When this patient first consulted me last September I found that he had been hoarse for eighteen months, and had suffered considerably from cough, which occasionally caused pain. There was no dyspnœa and no difficulty in deglutition.

Upon examining the larynx I found a large whitish growth with a granular surface, which extended the whole length of the left ventricular band from which it seemed to spring. The tumor projected from the surface nearly a centimeter. It hid the left vocal cord completely and covered about one-third of the glottis. An attempt to remove the growth with the ordinary laryngeal forceps failed on account of its firmness, but two or three pieces as large as peas were removed and a microscopic examination of these by Prof. Danforth, led to the conclusion that the growth was of a semi-malignant character. The patient was obliged to return to the country before any further operative procedures could be instituted. He was then given iodide of potassium freely for several months.

This patient returned to the city last week. Since I saw him in September, 1880, the tumor had grown so as nearly to obstruct the view of the glottis. Only the right vocal cord and a small part of the rima glottidis, about two millimeters in width, could be seen. (Fig. 12.) Dyspnœa had become quite constant, and the aphonia was much increased.



Fig. 12. Cancer of larynx.

By means of laryngeal knives and forceps, I removed at the first sitting, about two-thirds of that portion of the growth which was visible.

Two days later the patient returned, and I then discovered that the growth extended downward some distance below the



vocal cords. With the knives and forceps I now removed a large part of the obstructing mass so as to leave a free opening for respiration.

Prof. I. N. Danforth has examined portions of the tumor removed at the first sitting. He states that the growth has passed the semi-malignant period and that it is now a true cancer.

Prof. Bridge has examined some of the pieces removed at the second sitting and corroborates this serious diagnosis.

P. S.—This growth was removed as completely as possible, with laryngeal knives and forceps, and its base was thoroughly cauterized with solid nitrate of silver.

When he returned to his home the respiration was easy, the glottis being about three-fourths its normal size. His physician, Dr. H. Reineking, was requested to open the trachea as soon as dyspnoea again becomes urgent.

P. S.—Just as this was going to press I received a letter from Dr. R., stating that a few days after the patient's return, he found the sub-glottic portion of the growth somewhat enlarged since the operation. Twelve days later the enlargement was so great as to considerably obstruct respiration, and on the twelfth of June, about three weeks after the operation, he had been called in the night to see the patient, who was having great difficulty in respiration. Perceiving that tracheotomy would be necessary, he sent for another physician to assist him in the operation, but the messenger had hardly left the house when the patient ceased breathing.

The doctor promptly opened the trachea with no assistance save that of a few laborers, breathing was restored, and now the patient bids fair to make a good recovery from the tracheotomy.

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### ARTICLE III.

TREATMENT OF PNEUMONITIS, WITH ILLUSTRATIVE CASES. By  
P. O'CONNELL, M.D., Sioux City, Iowa.

During the past four years the treatment of pneumonitis has been frequently discussed in current medical literature. Several able articles have appeared, from time to time, in the journals, advo-

cating and detailing different and equally successful plans of treatment. The hope that others may try a method which is simple, inexpensive, and easily carried out, with the same gratifying result that I have had from it, prompts me to forward this contribution to the literature of the subject. Possibly the good result attained under very simple treatment may be a coincidence—may be only the natural history of pneumonia and not the result of the treatment employed. Although being *post hoc*, I consider it fairly *propter hoc*. Acute idiopathic lobar ("croupous?") pneumonitis is referred to in this connection.

The *antipyretic treatment*, in contradistinction to that usually followed by most practitioners in hospital and in private practice, consists essentially of the cold bath, large doses of quinine, and salicylic acid.

The *cold bath* is a very powerful means of abstracting heat from the body. The patient is kept in the bath during ten to twenty minutes or more, or until the temperature is reduced to about 100° F. The bath is always repeated under the personal supervision of the medical attendant, as often as the temperature mounts up to 103° F., or over. It requires frequent repetition, the reaction being often great and sudden, and the effect, therefore, but temporary. It certainly is difficult and troublesome to carry out, and is not seldom attended with some risks and unpleasant consequences. To patients and friends this plan seems not only heroic, which it really is, but positively appalling, and is consented to reluctantly. After fair trial it has not yielded very good results, and now has few advocates except among hospital physicians among English speaking peoples. For private practice it is practically useless.

*Quinine*, in some form, has many more advocates, and deservedly so. It is given by some in grain doses every hour, or five grains every four hours, or ten grains three times a day. Others give twenty to thirty grains morning and night, while a few give forty to fifty grains at once, and do not repeat the dose for twenty-four hours.

At Bellevue Hospital, New York, the cold bath was tried. The result was disappointing, and it was soon given up. Dr. James, of Frankfort, Kentucky, after a fair trial of the cold bath

does not think very highly of it. In his opinion the result was not proportionate to the disturbance to the patient, nor to the risks, nor to the labor necessary to carry it out. With it the deaths amounted to seventeen per cent.; with quinine, in large doses, the death rate was twenty per cent.; salicylic acid proved a total failure in his hands. It is but just to say that the above figures were obtained by Dr. James during an outbreak of sewer gas pneumonia, when the mortality will necessarily be high under any and all forms of treatment.

Antimony, for its expectorant and diaphoretic effects, will be beneficial in some cases. Its sedative action on the heart proves very useful occasionally. In strong, vigorous patients I have found it answer well. Children under five years of age cannot, of course, safely take it except in rare cases.

Opium, especially when there is much pain, will be both useful and necessary. Diaphoretics and expectorants, to which may be added small doses of opium and sometimes antimonial wine in nauseating or non-nauseating doses, as occasion may require, will often prove a useful combination. Yet, out of a total of sixty-four cases treated by Dr. Thomas Barr, of Glasgow, Scotland, with antimony, opium, diaphoretics and expectorants, or with a combination of these agents, he had a mortality of *one in six* in private practice.

There is quite a unanimity of opinion as to the benefit of external applications to the chest, over the inflamed lobe or lobes, linseed poultices being in greatest favor. Moist warmth is both soothing and agreeable to the patient. Frequently it is all that is necessary to relieve the stitch-like pain. In my opinion it favors and hastens resolution. Mustard, turpentine, and even blisters, occasionally, may be required, but not until the consolidation of the pulmonary parenchyma tends to linger.

The treatment which I now practice is as follows: A piece of thick white flannel, loosely wrung out of hot water, is wrapped round the chest and covered with some material impervious to air and moisture, such as oiled silk, gutta percha tissue, or thin oil cloth. If only the lower lobe in one or in both lungs be inflamed, the flannel need not extend higher than the axillæ. But when an entire lung is involved, then the flannel must cover

the entire thorax, apertures for the arms to pass through being cut in it. I deem it essential, and, therefore, always insist, that the flannel shall extend completely round the chest and overlap a little, at the ends, on the front of the thorax, whatever may be the extent of lung tissue involved. The outer air-tight covering should be a little larger, every way, than the flannel, so that the heat may not escape under the upper nor lower edge, nor at the sternum where the ends overlap. In all this there is nothing new. Dr. Flint speaks of it in his Practice of Medicine. Flannel heated and covered in this way retains its warmth quite as long as a poultice. I have, occasionally, used linseed poultices, but give the preference to the hot moist flannel, because it is much more cleanly and less troublesome; it is easily renewed by dipping it again in hot water and loosely wringing it. Besides, few can be relied upon to properly and efficiently make a linseed poultice.

Then genuine\* James' Fever Powder (*Pulvis Jacobi Verus*), one to five grains every two, three, or four hours, according to age, is prescribed. Five grains, to adults, is the maximum dose employed by me, while one grain can be given to a child under six months. The warmth of the flannel, aided by the James' Powder, soon induces and maintains gentle diaphoresis; the stitch-like pain is relieved; respiration becomes fuller and less hurried; cough grows softer and less hacking; expectoration becomes easy; the temperature steadily declines; the patient soon feels quite comfortable. If pain be very severe, a small hypodermic injection of morphia may be given to adults, although this will, I believe, be rarely required. In the case of children or adults, extract of opium or of belladonna, rubbed up with a little glycerin, may be painted on the skin over the painful part before applying the hot flannel; or tincture of opium, of belladonna, or of aconite root may be sprinkled on the flannel, whenever the attending physician should judge such useful. Children under five years of age will need an emetic of ipecacuanha once or twice a day, if they do not clear the lungs sufficiently by acts of coughing.

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\* *Pulvis antimonialis* is not James' Powder. It is a worthless substitute for it. See the CHICAGO MEDICAL JOURNAL AND EXAMINER for August, 1879, for a paper by me on True James' Powder

During illness, a light but nutritious diet of good soup, chicken broth, beef tea, and milk with a little bread or crackers, is allowed. If craved, I see no objection to a little chicken, mutton chop, or beef steak broiled. I have permitted such and seen no ill effects result. My chief reliance, however, is placed on milk, which is allowed *ad libitum*. Infants at the breast must depend on the mother's milk. If there be any evidence of prostration or depression, tonics and stimulants are administered. These I rarely had to employ.

The fifteen cases, of which brief abstracts are given below, may be interesting for the following reasons: 1. The disease was typical in all. 2. The beginning of illness was accurately determined in each case. 3. The circumstances and hygienic surroundings were, to all intents and purposes, the same in all. 4. The season of the year (cold weather) was the same in all except three. 5. All the cases were in private practice, and were under my personal care and daily observation from the beginning to the end of illness. 6. Careful physical examination of the chest was practiced daily in each case. 7. The treatment in all was identical and as described above, and was faithfully carried out. 8. In all the disease ended in complete resolution.

The duration of the disease is computed from the outset (which, in the majority, coincided with the time the patient took to the bed) as accurately determined, as I said already, by personal physical exploration of the chest, to the time when *convalescence* was *well established*. In a few cases the nature of the illness was determined before the patient was compelled to keep the bed. Ten, or two-thirds of the cases were children up to twelve years of age, and among whom delirium at night, of an active character, was a prominent feature in about one-half. I append very short notes of each case.

CASE I. Michael M., aged 32, very recently suffered from syphilitic caries of the vomer ending in perforation, walked into my office. Felt chilly. *Lowest lobe of right lung* becoming consolidated. Had rust-colored expectoration. Was six days ill. Recovery complete.

CASE II. Mrs. C., aged 31, multipara, nursing. Was extremely peevish and could not be induced to keep quiet in bed.

To this I attribute the long duration of her illness. *Left lower lobe* involved; had malar blush; was eleven days ill. Recovery complete.

CASE III. Eddie C., aged 4, robust. Had chill. *Lowest lobe in each lung* involved. Was nine days ill. Recovery complete.

CASE IV. Mortimer S., aged 5, recovering from a severe impetigo. Malar blush well marked. *Lowest and middle lobes of right lung* involved. Was six and a half days ill. Recovery complete.

CASE V. Lily H., aged 8, a delicate child. Had chill; well marked malar blush. *Right lowest lobe* involved. Was six days ill. Recovery complete.

CASE VI. Mrs. W., aged 39, multipara (eleven children), very fat, flabby, a beer drinker, recovering from acute rheumatism which induced labor at end of eighth month, five days ago. *Entire right lung* involved. Had rust-colored expectoration; malar blush on right side only. Was seven days ill. Recovery complete.

CASE VII. Emma W., aged 7, delicate, syphilitic (acquired by kissing) for past three years. *Entire right lung and left lower lobe* involved. Had malar blush and herpes at angles of mouth. Was seven and a half days ill. Recovery complete.

CASE VIII. Jennie M., aged 12, very slow, dull child. Had well marked malar blush. *Entire right lung* involved. Was seven and a half days ill. Recovery complete.

CASE IV. Willie C., aged 23 months, robust. Had malar blush. *Right lower lobe* involved. Was six days ill. Recovery complete.

CASE X. James S., aged 6 months, strong, nursing. *Right lowest lobe* involved. Was six days ill. Recovery complete.

CASE XI. William C., aged 30½. Had malar blush and rust-colored expectoration. *Right lowest lobe* involved. Was three days ill. Recovery complete.

CASE XII. Freddie A., aged 14 months, strong. Had chill, malar blush, and rust-colored phlegm got up by emesis. Partially weaned. *Entire right lung* involved. Was six days ill. Recovery complete.



CASE XIII. James S., aged 17 months. Second attack with interval of eleven months health between. (See Case X.) *Left lower lobe* involved this time. Was three and a half days ill. Recovery complete.

CASE XIV. William C., aged 31. Second attack, with interval of six months health between. (See Case XI.) Had chill, malar blush, and rust-colored expectoration. *Entire right lung* involved this time. Was two and a half days ill. Recovery complete.

CASE XV. John G., aged 11, very strong lad. Had malar blush. *Entire right lung* involved. Was three days ill. Recovery complete.

The first of these fifteen cases was seen in November, 1877, and the last in February, 1880—a period of two and a half years. Four cases happened in the month of January, three in February, one in April, two in June, one in August, and four in November; all in the city of Chicago. Although cold may have played some part, possibly the greatest part, in the causation, still I attributed several of the cases to the action of sewer-gas, and have no reason now to alter that opinion. The average initial temperature in each case was 103.2° F.

The shortest mean duration of acute pneumonitis is twelve days according to the writers within my reach. The mean duration of my fifteen cases is six days, with a minimum of two and a half and a maximum of eleven days. From the beginning of illness until the patient was permitted to leave his bed and move about the house, and, in some cases, to go out of doors, was, on an average, seven days.

The relative frequency of the presence or absence of any one particular symptom of the disease can be seen at a glance. The extremely rapid manner in which a lobe or even an entire lung, as seen in cases XI, XIII, XIV, and XV, may become consolidated and just as quickly completely clear up again is interesting and remarkable.

## ARTICLE IV.

THE PATHOLOGY AND TREATMENT OF YELLOW FEVER; WITH SOME REMARKS UPON THE NATURE OF ITS CAUSE AND ITS PREVENTION. By H. D. Schmidt, M.D., New Orleans, La. (Continued from page 622, June No., 1881.)

## THE STOMACH.

In all serious cases of yellow fever, whether terminating favorably or not, this organ, like the liver, is deeply involved in the pathological process, originally called forth by the introduction of the specific poison of the disease into the blood. In consequence, the clinical symptoms arising from this implication of the stomach, and consisting mainly in a disturbance of its circulation, are, as we have seen, very annoying to the physician, and, at the same time, so distressing to the patient, as to have induced a number of the older physicians and authors to even regard this organ as the true seat of the whole disease. Although it may be justly presumed that the functional disturbances of the stomach are partly depending on the common cause—the presence of the poison in the blood—it is nevertheless true, that the congestion of the gastric veins is only secondary in its nature, depending upon the imperfect portal circulation in the liver. The condition of the stomach, therefore, may in all cases, as I have before hinted at, serve as a true index to that of the liver. And, in order to render the demonstration of the disturbances in the gastric circulation more perspicuous, it may be proper to briefly review the particular blood vessels supplying the mucous membrane of the stomach with blood, and their arrangement.

It will be remembered that the larger blood vessels sent to the stomach form two arches along the so-called curvatures of this organ. The arterial arch along the lesser curvature is formed by the union of the *coronary* artery and of the *pyloric* branch of the hepatic, while that along the greater curvature is formed by the right *gastro-epiploic* branch of the splenic artery; the latter, also, furnishes some small branches, the *vasa brevia*, to the “cul de sac.” The veins, corresponding to these arteries, return

their blood to the splenic and superior mesenteric veins, which by their junction form the portal vein ; sometimes the coronary vein joins the latter directly. The branches arising from these vessels, both arteries and veins, in entering the walls of the stomach, penetrate through its muscular coat to be distributed throughout the sub-mucous tissue in which they divide into subordinate branches. Of these, the finest arterial branches penetrate the muscular layer of the mucous membrane, and arriving at the glandular layer, give rise to a network of capillary vessels with oblong meshes surrounding the individual gastric glands, and extending to the vicinity of their apertures. Here the capillaries of the network somewhat enlarge in diameter, while their meshes assume a more regular polygonal form, each mesh surrounding the aperture of a gland. From these larger capillaries the venous radicles take their origin in the form of minute branches, a small number of which, representing a small district of the mucous membrane, join to form a somewhat larger vessel, which, without receiving any additional branches, descends vertically to join a venous network, extending between the glandular and muscular layers of the mucous membrane. From this network, other branches arise, which, by penetrating the muscular layer, join those larger veins ramifying, in company with the arteries, throughout the sub-mucous tissue, and which finally penetrate the other coats of the stomach to reach their ultimate destination, the splenic, or superior mesenteric vein.

As regards the function of the capillaries of the mucous membrane of the stomach, it may be mentioned that the larger kind, forming polygonal meshes around the apertures of the gastric glands, have been regarded as subserving the process of absorption, while those surrounding the gastric glands themselves, smaller in diameter, and forming oblong meshes, are considered to furnish the material for the secretion (*Frey*). We may now proceed with the description of the pathological changes taking place in the mucous membrane of this organ.

In almost all cases of yellow fever, this membrane is found more or less congested. The congestion, however, does not extend uniformly throughout the whole membrane, or even larger portions of it, but is confined to smaller or larger spots or dis-

tricts, in which it is observed to proceed from one or more centers. From these centers it extends or radiates in a lesser degree, either gradually to be lost, or to pass over to another congested district. It is owing to this peculiarity of the congestion that it presents no uniformity of character, but is observed to spread irregularly over larger or smaller portions of the membrane. Neither are the congested portions of the latter limited to any particular region of the organ; they may be nearer to the cardiac, or to the pyloric extremity; in most instances, however, they are found in that portion forming the greater curvature. In examining the congested portions of the mucous membrane with a loupe, magnifying about five diameters, the congestion will be found confined to the minute venules, presenting an arborescent arrangement resembling the broken meshes of a vascular network (Fig. 6, *a*). From the center of each individual district, corresponding to the apparent trunk of these minute vessels, a few fine branches are seen to proceed, which in their turn give rise to still finer ones, the whole resembling the branch of a tree without leaves. From our description of the arrangement of the blood vessels of the mucous membrane of the stomach, given above, it may be inferred that the finest of these vessels are identical with those minute venules arising in the upper and larger capillaries, surrounding the apertures of the gastric glands, and that the branches, formed by their junction, converge to a common center, in order to form one of those larger vessels, which, without receiving any additional branches, descend between the gastric glands (Fig. 5) to join their respective venous network extending between the glandular and muscular layer of the mucous membrane.

This particular form of congestion prevails in a greater or lesser degree in almost all the congested portions of the membrane. Each descending venule or vein, as has been seen, forms one of the centers, while its minute tributaries represent the districts. Nevertheless, in most fatal cases, besides this particular form of congestion, a number of small and defined spots or patches are also found, presenting a distinct red color, and resembling small ecchymoses or extravasations of blood. Their size is very limited, ranging from that of a mere dot to about

two or three mm., seldom more; and if they are examined with a strong loupe, they are found to consist of an unbroken network of minute vessels, congested with blood (Fig. 6, *b*), and identical with that network of large capillaries which surrounds the apertures of the gastric glands. In most instances, these small congested spots or patches are found between or along the sides of the plicæ, sometimes extending over the summit.

In examining thin sections made vertically through one of these small congested patches, the peculiar character of the congestion can be clearly demonstrated. In such sections (Fig. 5), then, it will be found that, while the arteries with their *capillaries*, surrounding the gastric glands throughout nearly their entire length, are *empty*, all the veins throughout the entire wall of the congested portion of the stomach are congested with blood. The congestion commences in the network of large capillaries, surrounding the apertures of the glands, whence it extends through the venous radicles to all other veins of the organ, contained in the section. These large capillaries, especially, are distended with blood corpuscles, which, in a number of places, may be observed to have ruptured the minute vessels, and extravasated into the surrounding tissue. In other places, again, no rupture has taken place, but, in consequence of the stasis of blood, which obviously must have existed in these localities, the blood corpuscles have parted with their hæmoglobin, which, passing through the walls of the vessels, was absorbed by the neighboring epithelial cells, as shown by the brown color they present to the eye of the observer. Thin sections, sliced off with a sharp knife from the surface of one of these spots, embracing the outer epithelium, also show distinctly the condition of the membrane just described. It will be easily understood that the hæmorrhagic effusions into the stomach, occurring during the course of yellow fever, and represented by the "black vomit," are derived from the rupture of these minute vessels. In the numerous sections of the mucous membrane of the stomach which I have examined, I have failed to discover any product of inflammation.

It has been asserted, and is believed by a number of physicians, that in yellow fever the epithelium of the stomach underwent fatty degeneration. During the epidemic of 1867, but

particularly during that of 1878, I had carefully examined the fresh epithelium of a considerable number of stomachs without finding any traces of this degenerative process. Nor can it be demonstrated in the thin sections of the hardened specimen, in which the details of the cellular elements can be minutely studied. On the contrary, it is not only found that the epithelial and glandular cells contain no fat globules, but, moreover, that their protoplasm is very readily colored by the staining liquid.

With the exception of the pathological changes above described, none are observed in the remaining tissues of the stomach.

#### THE INTESTINES.

The distribution and arrangement of the blood-vessels of these organs being very nearly the same as that met with in the stomach, it may be expected that the congestion of these parts also partakes of the same character. But though, in the greatest number of fatal cases, the larger veins, emerging from the walls of the intestines to become tributaries of the portal vein, are found filled with blood, the congestion of the minute vessels of the mucous membrane very rarely attains as high a degree as in the same membrane of the stomach. An explanation of this fact may be found in the distance intervening between the portal vein and the mucous membrane of the intestines, being greater than that existing between this vessel and the mucous membrane of the stomach. The first effect of any retardation of the portal circulation of the liver will, of course, be felt in those tributaries which the portal vein receives nearest to this organ. For this reason, hæmorrhages into the intestines only take place in very severe cases, though a congestion of the venous radicles is frequently observed, especially in the upper portion of the small intestines. When blood is observed to pass from the bowels, however, it does not always signify that a hæmorrhage from the mucous membrane of the intestines has occurred, as it may possibly be derived from a hæmorrhage into the stomach, and, instead of being vomited, be discharged by way of these organs. The appearance which the congested mucous membrane of the intestines presents to the eye of the observer is very similar to that of the congested portions of the stomach above described, having its seat in the minute venous radicles. Those small red spots or patches, formed by a



congestion of the larger capillaries, surrounding the apertures of the glands, are rarely met with upon the mucous membrane of the intestines.

#### THE SPLEEN.

This organ is almost always found in a normal condition; any deviation from the latter should, as in the case of the lungs, be considered as having no relation with yellow fever, but depending upon other causes. The only pathological phenomenon which the microscopical examination in some cases reveals, consists in the presence of small masses of black pigment, deposited in the pulp of this organ, but which are frequently met with in malarial spleens and livers. The blood-corpuscles, neither, present anything remarkable in their form, or otherwise. These statements are based upon the examination of the fresh pulp in a number of cases, and, furthermore, upon that of thin microscopical sections of the hardened specimen.

#### THE KIDNEYS.

In almost all fatal cases of yellow fever, the microscopical examination shows that certain pathological changes have taken place in the parenchyma of these organs. These changes, as I shall show directly, chiefly consist in a degeneration of the epithelium lining the uriniferous tubules, and, in some instances, they exist to so small an extent as not to alter the normal appearances presented by the cut surfaces of the kidneys to the naked eye. Among the autopsies which I performed during the epidemic of 1878, I met with a number of such specimens of kidney, the normal appearance of which so much misled me as to make me indifferent to their preservation. Subsequent microscopical examinations of thin sections made from similar specimens, however, showed me that even in these kidneys of normal appearance the peculiar changes do exist, and are easily demonstrated; and, in consideration of their almost constant occurrence, they may safely be regarded as characteristic of yellow fever.

As the anatomical construction of the kidneys is quite complicated, I do not consider it out of place to briefly review it before proceeding to the description and discussion of the pathological phenomena observed in these organs.

When a kidney is divided longitudinally, the cut surface appears as if consisting of two different substances. The one forming the external portion of the organ, and accordingly called "cortical," presents a granular appearance, while the other, called "medullary," is collected in conical or pyramidal masses, and appears to consist of bundles of fibers, converging in each pyramid from the base to the apex. Thus the kidney may be regarded as composed of the cortical substance and about a dozen, or more, of these conical bodies, the bases of which are connected and surrounded by the former, while their apices, represented by the *renal papillae*, project into the cavity, or *sinus*, of the organ; and, furthermore, each pyramid, together with its respective portion of cortical substance, may be looked upon as a separate gland. In embryonic life, the kidney really consists of a number of minor kidneys, held together by connective tissue, which subsequently become blended with each other. The secreting portion of the kidney is represented by an immense number of tubules, lined by a layer of epithelial cells, the true secreting elements. The mutual relationship of these tubules is quite simple, consisting in the junction which a number of the primary tubules form with a particular kind of straight or collecting tubules, and in the union of these to form, finally, still larger ones, the *ductus papillares*; but the changes which they undergo in their diameter and in the direction of their course, together with the peculiar arrangement and distribution of the blood-vessels, render the study of the renal parenchyma rather complicated. The apparent difference existing between the cortical and medullary substances is owing to these variations existing in the diameter, form, and course of the uriniferous tubules, and in the arrangement of their minute blood-vessels, though a distinction may be presumed to exist in their functions; that is, the cortical substance representing the proper secreting portion of the gland, while the medullary, consisting entirely of straight and larger tubules, represents that portion through which the secretion is discharged.

If the cut surface of the cortical substance is examined with a sufficiently strong loupe, a considerable number of minute spherical bodies will be observed; these are the so-called "Malpighian

bodies," upon which the uriniferous tubules commence. Each of these bodies consists of a conglomeration of minute vessels, surrounded by a thin capsule, the continuation of which, in the form of a short and narrow constriction or neck, represents the commencement of a uriniferous tubule. The capsule itself, consists only of a layer of flat pavement cells (endothelium), surrounded by a thin layer of connective tissue, while the tubule, throughout its entire length, represents a tube of a structureless so-called basement-membrane, lined by an epithelial layer of cells, which, in different portions of the tubule, assume a different form and arrangement. The tubule, after having arisen by its neck from the capsule, rapidly enlarges in diameter to form a comparatively wide tube, which, bending into several convolutions, pursues its course in a slightly oblique direction toward the center of the kidney; but, diminishing again in diameter to about one-third of that of the convoluted portion, it suddenly makes a turn and descends vertically toward the medullary substance, forming thus what is called the *descending limb* of the tubule. After penetrating, to a lesser or greater distance, into the medullary substance, it makes, opposite to the side whence it came, a short bend upon itself (loop of *Henle*), and ascends again in a vertical direction, forming the *ascending limb*. Having passed beyond the height of its respective Malpighian body, it again enlarges in diameter, and forms the *intermediate* portion or canal, consisting of a few convolutions. This portion, after being once more reduced in diameter to a very fine tubule, makes a turn sideward to join its respective *collecting* tubule. The collecting tubules commence near the surface of the kidney, where they receive a limited number of primary tubules, and thence pass, without receiving any others, in a direct vertical direction into the medullary substance. Here, in uniting with others of their own kind, they form larger tubules from which, by successive union, the ductus papillares finally result.

The initial or convoluted portion of the uriniferous tubule is lined by an epithelium consisting of cells of a turbid appearance, and of a slightly conical form, resting with their bases upon the interior surface of the basement-membrane of the tube, and presenting their smallest surfaces (the apices) to the lumen of the tube. In

the narrow descending limb, to some distance beyond the loop of Henle, the epithelium consists of smaller cells arranged in the form of a pavement, their nuclei projecting into the interior of the tube. In the ascending limb, the cells assume a somewhat squamous arrangement up to the intermediate canal, which is lined by the same epithelium as found in the convoluted portion of the tubule. The epithelium found in the collecting tubules, and in those larger ones formed by the latter, consists of slightly conical cells, presenting their smallest surfaces to the lumen of the tube.

In the same manner as the kidney is composed of a certain number of conical or pyramidal bodies, these, on their part, consist of a considerable number of primitive cones formed by bundles of collecting tubules, together with the primary tubules they receive. These bundles may be regarded as separate lobules of the gland, for all the collecting tubules of one bundle are received by one and the same of the larger tubules, by which, finally, the ductus papillares are formed. And it is by these separate bundles of collecting tubules that the peculiar striated appearance, observed on the cut surface of the organ, is produced, the striæ being formed by the bundles and their interspaces. In the latter, the blood vessels are lodged.

The distribution of the blood vessels in the kidney is rather peculiar. The smallest branches, resulting from a successive division of the renal artery, proceed at once to the inner border of the cortical substance. Here they give rise to two sets of minute vessels—the *inter-lobular* (arteriæ interlobulares) and the *straight* arteries (arteriæ rectæ), which proceed in opposite directions. The interlobular arteries enter the cortical substance, and, lodged in the interspaces of the primitive cones, pursue their course toward the surface of the kidney, while, at the same time, they send minute arterial twigs (*vasa afferentia*) to the Malpighian bodies. Each of these arterioles penetrates the capsule of one of the latter, and then divides into a limited number of capillary vessels, which, after having formed a number of loops among themselves, reunite to form again another minute vessel (*vasa efferentia*), which leaves the capsule near the place at which the afferent vessel had entered. The conglomeration of vessels thus

formed in the interior of the capsule represents the so-called "glomerulus." After having left the glomerulus, the efferent vessel terminates in the true capillary network surrounding the uriniferous tubules of the cortical substance, and giving rise to the radicles of interlobular veins.

The straight arteries, arising by a short trunk from the same renal branch as the interlobular, enter the medullary substance, in which, lodged in the interspaces of the primitive bundles of tubules, they give rise, successively, to small bundles of very fine straight vessels, the subordinate branches of which terminate in the regular capillary network, surrounding the tubules of the medullary substance, and consisting of long meshes. The vasa efferentia of the glomeruli near the border of the cortical substance, also, join this network of capillaries, in which the venous radicles of the straight veins arise.

Before dismissing the anatomical construction of the renal parenchyma, it may be further remarked that the glomerulus has no direct connection with the interior surface of the capsule, being only suspended in the cavity of the latter by its root, formed by the afferent and efferent vessel; neither does the liquid contained in the cavity directly touch the walls of the capillary vessels, they being covered by a layer of delicate cells, the nuclei of which are conspicuously distributed over the entire glomerulus.

While in the parenchyma of the liver the degenerative process, as we have seen, chiefly consists in an infiltration of fatty matters, derived from the blood and absorbed by the hepatic cells, we find it represented in the kidney by a true degeneration of the protoplasm of the epithelial cells lining the uriniferous tubules. The pathological process in the kidney appears to be initiated, as in the liver, by a general hyperæmia of the organ, the traces of which may still be detected by the microscopical examination. But, as in most fatal cases of yellow fever the congestion has, at the time of death, become greatly diminished by the ensuing degeneration, it is not often, when the autopsy is made, that the kidneys present a highly congested condition. Nevertheless, I have met, in former epidemics, with a limited number of cases, in which the kidneys presented the reddish-blue color of congestion to a considerable degree. And even in those kidneys

in which the degenerative changes have already become perceptible to a microscopical examination, some portions of the organ may still be found in a state of hyperæmia. The traces of the congestive stage of the kidneys are best studied in thin sections. The microscopical examination of these sections shows that, in most cases, the congestion was at the time of death confined to the straight and interlobular veins, which are still found filled with blood corpuscles. However, not unfrequently a number of the capillary vessels, especially those along the border of the medullary substance (*Grenzschicht* of *Ludwig*), forming oblong meshes, are also found filled with blood. And, moreover, in some instances, I have even observed the minute vessels of a number of glomeruli in the same condition, indicating that the congestion must have extended throughout the capillary network of the cortical substance; and, in considering the contraction of the minute arteries, very probably taken place at the time of death, it may be presumed that, even in those cases in which only the minute veins were found filled, the congestion had likewise existed in the capillary network before the fatal issue took place. The presence of hæmoglobin, which in a number of cases may be demonstrated in the epithelium of the uriniferous tubules, moreover, corroborates the latter supposition.

The degenerative process, taking place in the renal parenchyma during the course of yellow fever, is in some respects peculiar, and appears not to resemble, in all points, the fatty degeneration of the kidney observed in connection with parenchymatous nephritis. The chief part of the process rather consists in a gradual breaking down and dissolution of the epithelial cells of an indefinite number of uriniferous tubules, terminating in most instances in a fatty metamorphosis of the remains. As a result of the degeneration, numerous so-called albuminous cylinders, and other infarctions, differing in composition and form, are formed in the interior of a considerable number of uriniferous tubules. These urinary infarctions, met with in certain organic affections of the kidney, have, since their discovery, always attracted the attention of pathologists, and as the probable origin and mode of formation seems to be still an open question, I shall endeavor to render a true account of their appearance in the yellow fever



kidney, and also of their relationship to the degenerated epithelial cells. In doing so, I shall discuss the most prominent points of the question with special reference to their bearing upon the pathology of yellow fever. But, in order to facilitate the description of the condition and probable nature of the degenerated cells, and of the infarctions, I should make some preceding remarks upon the advantages derived from staining the thin sections of kidney with carmine, a valuable accessory in these studies, for the purpose of discriminating correctly between the different degrees of degeneration in which the cells may be affected, and also for determining the particular nature of the different forms of infarctions.

Knowing, namely, that the absorptive power of an organic cell is proportionate to the normal condition of its protoplasm, the extent or degree of the degenerative process, going on in the latter, may be determined by the degree of the coloring. The epithelial cells of the uriniferous tubules, therefore, will be perfectly colored as long as they are in their normal condition, but as soon as their protoplasm commences to degenerate, their absorptive power diminishes, and they appear only faintly colored; or, if the process of degeneration has farther advanced, the protoplasm remains colorless, while the nucleus may still be colored, or, if likewise degenerated, remain uncolored. The fatty matters resulting from the metamorphosis, remain, of course, uncolored, and appear yellowish when seen under the microscope. The so-called albuminous cylinders possess a considerable power of absorption, and appear highly colored. If hæmoglobin is present in the cells, they assume, in proportion to its quantity a more or less brown color; in relation to this body, especially, the carmine is preferable to other colors.

The infarctions formed in the uriniferous tubules during the course of yellow fever, differ somewhat from each other in their origin and formation. A number of them represent albuminous cylinders, while others consist of the remains of degenerated epithelial cells, or may even be composed of both. They are met with in all portions of the uriniferous tubules, and in correspondence with the diameter of these canals, vary in thickness. The largest are found in the convoluted portions, the so-called tubuli

contorti, and in the intermediate canals (Schaltstuecke of *Schweigger-Seidel*), which they frequently fill up throughout their entire length. In the ascending and descending limbs and in the collecting tubules, they only exceptionally attain a great length, being generally short in extent. The relative number in which they are found differs considerably in different kidneys, and is proportionate to the extent of the pathological condition of the organ, which, as has been remarked before, greatly differs in different cases. Neither do the particular forms of infarctions stand in any fixed relation to the extent of the destructive changes in the kidney, for, while a considerable number of the simple albuminous cylinders may be met with in one case in which these changes exist to a great extent, they may hardly be observed in another case, in which only a comparatively small number of uriniferous tubules may be affected by the degeneration, or be obstructed by another form of infarction. In the same way does the degree of the degenerative process not always correspond to the extent in the organ, for there are cases met with in which few, or even no albuminous cylinders are observed, and in which the epithelium of only a small number of uriniferous tubules are found to undergo degeneration, but in which the latter process has nevertheless arrived at the fatty metamorphosis,—while there are other cases again, in which the formation of fat is hardly observed. To explain this discrepancy in the extent or degree of the pathological changes in the yellow fever kidneys, the comparative length of time preceding the fatal issue, and also the severity of the attack, must be considered; for, in those cases of a rapid course, and in which the patient succumbs in a few days from the effects of the cerebral disturbances, the kidneys may be found affected to only a small extent, while in other, more protracted cases, more time is afforded to the pathological process to extend farther throughout the organ.

Before proceeding to the description of the infarctions, a previous examination of the particular condition of the epithelium of the uriniferous tubules, which not only furnishes the material to the greater number of the obstructions, but, moreover is probably otherwise instrumental in their formation, may not be considered out of place. And, for this purpose, I shall refer in my

description to one of those cases, in which the pathological changes observed are decidedly pronounced.

In examining a very thin section of kidney of such a case (Fig. 7), perfectly stained with carmine, it is found that the epithelium in the tubules has considerably diminished in its normal thickness (*b*). This observation is made as well on the entire tubule as on the transverse section of it. In the convoluted portions of the tubules, especially those surfaces of the cells directed toward the lumen, and which in the normal condition are conical, are now observed to be flat, causing the cells to appear rectangular in form. The lumen of such a tubule, as it is seen in a transverse section, therefore, will be found much larger than it is in the normal condition, though the epithelium may be intact; this is owing to the cells having lost their turgescence and conical appearance. In many cells, especially when viewed in profile, the nucleus appears more deeply colored than the protoplasm of the cell, while in others the color is more evenly diffused throughout the whole. In the greater number of tubules, the epithelium appears intact, but there are many others in which it is detached from the basement-membrane, leaving an interspace between it and the latter. In a number of other tubules, portions of the epithelium are observed to be completely separated from the basement-membrane, and to project into the lumen (Figs. 7, 8 and 9), or, its cells may be seen separating from each other, singly, or in small shreds. In some tubules, finally, the entire epithelium appears broken up, and with the exception of a small number of very faintly colored, or colorless cells, still adhering to the basement-membrane, either in small groups or singly, the whole tubule appears empty.

The cells of the epithelium, however, while undergoing this process of atrophy and disintegration, show as yet no traces of fatty metamorphosis. Most of those, still in contact with the basement-membrane, and, in severe cases, even forming the greater portion in the section, have absorbed carmine, especially their nuclei. But as soon as they are detached from this membrane, their power of absorption diminishes, and they appear but very faintly colored; or even, while the nucleus may still present a feeble carmine tint, the protoplasm of the cell has remained

uncolored. It is not until they separate from each other that their degeneration and disintegration is really perceptible. The destructive process appears to consist in a dissolution or melting down of the hyaline portion of the protoplasm, liberating the granules, which, together with the hyaline substance, finally undergo a fatty metamorphosis (Figs. 11 to 15). At any rate, the granular remains of these cells do, at first, not always present a fatty appearance, though, soon after, the dark contours and the refractive property of the minute granules give sufficient evidence of their fatty nature. Very often, larger or smaller fragments of cells are observed to form a part of these remains, indicating again the grouped arrangement of the granules of the protoplasm, to which I referred in connection with the hepatic cells. In consequence of the breaking down of the protoplasm of the cells, the nuclei are set free, and traveling along with the general mass, they form a part of the resulting infarctions, in which they are almost always observed, either singly, or in clusters. They are then distinguished by being higher colored than the rest of the accumulation.

It is a remarkable fact that, during this process of fatty metamorphosis, taking place in the epithelium of the uriniferous tubules, it is quite rare that larger fat-globules are met with. I have examined a great number of sections for this special object, and have also found larger fat-globules in some of the tubules, especially in those near the capsule; but the number of these instances is so limited that their occurrence may rather be regarded as an exception to the rule. The comparative rarity, or absence, of larger fat-globules may be explained by the constant flow of some urine, even through these obstructed tubules, interfering with their formation. This supposition is corroborated by the streaked, thread-like appearance of the fat as it is observed in the interior of the tubules, particularly directly below the infarctions. Here it appears in long streaks of a yellowish color (Fig. 14), forming quite a contrast to the carmine coloring of the cells. Minute fatty granules, distinguished by their dark contours and high refraction, together with other cellular debris, are observed with these streaks.

In consequence of the degeneration and disintegration of the epithelium, many portions of the tubules are met with entirely denuded of their epithelial lining (Figs. 7 and 8, *d*). Although in the convoluted portions this condition is also observed, it is, nevertheless, more frequently found in the smaller tubules; and it is remarkable that not only single tubules are met with stripped in this manner of their epithelium, but generally a whole group or bundle, including descending, ascending, and collecting tubules. The only explanation which I can find for this phenomenon is that these groups represent certain arterial districts. But, even in these empty tubules, epithelial cells, singly or in patches, together with accumulations of granules and nuclei, may frequently be observed. In most instances, perhaps, the empty tubules have preserved their normal caliber, though not unfrequently groups are met with in a collapsed condition, their basement-membrane presenting faint outlines.

Besides the condition of atrophy and degeneration just described, in which the epithelial cells of the uriniferous tubules are found in yellow fever, there is another condition, indicated by a peculiar appearance of a considerable number of cells, and which seems to precede that of atrophy and degeneration. The special description and consideration of this condition, however, I must postpone until I have described the appearance and the nature of the infarctions.

These infarctions, besides differing from each other in composition, are met with in the uriniferous tubules in different conditions. The so-called albuminous cylinders, when examined in an uncolored section, appear under the microscope finely granular, amorphous, faintly glistening, and of a yellowish color. They are, however, studied to a greater advantage in sections stained with carmine, in which, with the exception of the color, they present, especially in transverse sections of the tubules, the same characters. Possessing, as already mentioned, the power of absorbing coloring materials in a very high degree, they appear in such sections very highly colored, and exhibit the carmine tint with a greater brilliancy and intensity than the normal protoplasm of the cells; therefore, when they are met with in their pure condition, that is, unmixed with epithelial fragments and

remains (Fig. 7, *a*), they are easily recognized by their brilliant and even coloring. They generally fill up the whole lumen of the tubule, and mostly terminate in tapering, rounded-off extremities. In most instances, perhaps, they are still surrounded by the epithelium, though not unfrequently they are met with in denuded portions of the tubules, and in direct contact with the basement-membrane. When covered by epithelium, the outlines of the cells may still be recognized, though the whole cylinder appears somewhat darker. Many of these cylinders are found in a broken condition, either simply fractured across, or into a number of greater or smaller fragments of rectangular or polyhedral forms. It is difficult to determine the cause of these fractures, though it may be safely presumed that they occurred by the instrumentality of the knife during the cutting of the sections. In the study of these sections, therefore, the investigator should take this circumstance into account, in order to guard against false conclusions, which he otherwise might draw from his observation. There are, nevertheless, specimens of these broken cylinders here and there met with, of which the fragments appear to have been removed from each other after the occurrence of the fracture, while their angular borders appear slightly rounded, as if washed away by the passage of the urine. Whatever the cause of these fractures may be, they, themselves, at least, give evidence of the brittle nature of these cylinders, which, accordingly, bear resemblance to the so-called "waxy cylinders," frequently met with in interstitial nephritis. A number of these cylinders are observed, which appear distinctly granular in their composition, the very minute granules exhibiting dark contours. Not unfrequently the lower end of the cylinder is in a state of dissolution, when the individual granules may be distinctly seen. And if the very border of the disintegrating extremity is closely examined, some of the granules may almost always be observed exhibiting their fatty nature by their refractive property and dark contours.

Perhaps the greater portion of these cylinders is found to contain epithelial remains, consisting of granules, nuclei, and even entire cells, or their fragments (Fig. 8, *a*). Mostly, their morphological elements of the epithelium are irregularly mixed up into a shapeless mass, but very frequently cylinders are observed



containing, besides the granules, a whole cluster of nuclei, or even entire cells. If these fragmentary remains of the epithelium have, as yet, not undergone the fatty metamorphosis, they appear more intensely colored than the original substance of the cylinder itself, and exhibit very dark contours and a peculiar luster. But not unfrequently instances are met with in which a portion, or the whole, of these epithelial remains have already undergone this metamorphosis, and accordingly appear lighter, or even yellowish, but also with dark contours, especially the granules (Fig. 15, a). The degenerated epithelial elements, not enclosed in the cylinder, of course, exhibit distinctly the fatty appearance, as before described. As regards the relative proportion of the albuminous substance of the cylinders with the epithelial remains, it, of course, must differ in every combination of cylinder formed, and be subject to much variation. It may be presumed that the epithelial elements have accumulated in the lumen of the tubule previous to their saturation by the albuminous substance, to which the intense coloring must be attributed. Judging from the tapering form of the extremities of these mixed cylinders, and also from the irregular outlines observed on some of them, they appear to be prone to a gradual liquefaction.

A third kind of infarctions met with in the uriniferous tubules, in yellow fever, are those solely composed of the disintegrated and degenerated epithelial elements. They consist of granular masses of irregular forms, derived from the degenerated cells, and mostly enclosing free nuclei and cells, or their fragments; sometimes, however, clusters of entire nuclei and cells are observed (Fig. 8, e). The size or extent of these accumulations is very variable, but it may be stated that, as long as they remain free from being saturated by the albuminous liquid, they never assume the same dimensions as the albuminous cylinders above described, though they are met with in the same localities as the latter. Neither do they appear to become very easily stationary in one particular place of the tubule; on the contrary, being of a softer consistence, and more yielding, and, furthermore, undergoing easily fatty metamorphosis, they are carried along by the pressure of the urine. These epithelial accumulations are frequently observed in a state of fatty degeneration, the whole mass

appearing yellow, or, sometimes, yellowish mixed with brown; in the latter instances the brown color represents hæmoglobin, previously absorbed by the protoplasm of the cells.

Having thus far described the degenerated condition of the epithelium, lining the uriniferous tubules, and the peculiarities of the different kinds of infarctions, formed in the latter during the comparatively brief course of yellow fever, I shall now consider the probable origin and mode of formation of these infarctions, and, moreover, briefly review the existing theories on the subject.

The old theory of the mode of formation of the so-called albuminous cylinders referred the process to a transudation of the albumen of the blood through the walls and the covering cells of the minute vessels of the glomeruli into the uriniferous tubules, in the interior of which the cylinders were formed by a precipitation of the albumen from the urine. This theory is entertained by perhaps the majority of pathologists, though the other, more recent, according to which the cylinders represent a product of secretion from the epithelial cells, or are even the result of a transformation of these cells themselves, is also supported by a number of distinguished authorities. To myself, the old theory hitherto appeared sufficiently plausible to explain the whole phenomenon, though I must confess that an observation which I made during these studies on a considerable number of epithelial cells, to be described hereafter, has induced me to view the more recent theory in a different light. Let us, therefore, examine both sides of the question.

As the old theory is sufficiently understood to pass without further explanation, I shall, in support of it, only cite the views of *Runeberg*,\* one of the more recent investigators into the pathogenetic condition of albuminuria. They are as follows: "The transudation of serum albumen always takes place in the glomeruli. It is conditioned by an increased permeability of the walls of the looped vessels of the glomeruli and of the epithelium covering them. In consequence, the particles of albumen suspended in the serum of the blood, which under normal conditions

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\* *Virchow u. Hirsch, Jahresbericht etc., für das Jahr 1878, Vol. I, p. 219.*

are unable to pass through the membranes of the glomeruli, may now in part be filtered with the remaining constituents of the urine. This increase of permeability is, in otherwise healthy kidneys, already caused by a considerable diminution of the difference between the pressure of the blood inside the glomeruli and the counter pressure existing in the uriniferous tubules. The accidental or transitory albuminuria is, therefore, conditioned by a considerable augmentation of the presence of the blood in the glomeruli, or by a diminution of the pressure in the tubules, or by both of these circumstances. In the permanent albuminuria, however, increased permeability of the filtering membrane is conditioned by an inflammatory or degenerative process affecting the vessels of the glomeruli; but, even here, the permeability is perceptibly influenced by the relative amount of pressure, and, in the same direction, also the amount of albumen in the urine, as explained before. A part of the albuminous substances, as the egg albumen and the hæmoglobin, are in a higher degree filterable than the serum albumen. As soon, therefore, as these substances are, in any way, mixed with the serum of the blood, they at once, even under normal conditions of the pressure of the blood, filter into the urine like the soluble salts."

The more recent theory, according to which the cylinders represent a product of secretion from the epithelial cells of the uriniferous tubules, or result from a transformation of these cells themselves, has been advocated by *Oedmansson*, *Axel Key*, *Oertel*, *Rovida*, *Senator*, *Heynsius*, *Bayer*, *Birch-Hirschfeld*, *Aufrecht*, and probably by a number of other pathologists. I shall cite the views of some of these authors. Thus, *Rovida*\* who subjected the urinary cylinders to an extensive chemical examination distinguishes three particular kinds, the *colorless*, the *yellow*, and the *epithelial*. As regards the chemical nature of the colorless, and the yellow or waxy cylinders, he says, that they do not represent albumin, or an albuminate, nor one of the known bodies derived from albumen, although they chemically resemble the latter substances.

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\* I. c.—für das Jahr 1872, Vol. I, p. 206.

He states a case of diffused nephritis without contraction or amyloid degeneration of the kidney, in which, beside colorless and yellow cylinders, numerous yellowish minute scales, exhibiting a similar luster as the latter, had been observed in the urine during the life of the patient. The same elements were met with in the fresh kidney, when microscopically examined after death. After the organ had been hardened in Mueller's fluid and in alcohol, the epithelium of the convoluted tubules appeared turbid and granular, so that the nuclei could scarcely be distinguished; the lumen was filled up, partly with homogeneous, partly with slightly granular globules of the same color and refractive as the yellow cylinders. In many uriniferous tubules, spherical drops of yellow color were observed, especially in transverse sections, to project from the epithelium; they were also found, here and there, in the lumen, partially collected into irregular polyhedral figures. In other places they formed an almost spherical contour, blending toward the center with a firmer, more compact mass, which, filling up more or less perfectly the lumen of the uriniferous tubule, represented a yellow urinary cylinder. From this observation, Rovida concludes, that the yellow cylinders, also, are products of secretion from the epithelium of the uriniferous tubules, the same as had been previously shown by Oedmansson, Key, and Oertel in connection with the colorless cylinders. But, finding in the same kidney, in some places, especially in the descending and ascending tubules and in the loop of Henle, the epithelium yellowish and more refracting, he agrees with Key, in admitting that the cylinders may also be formed by a fusion of transformed cells.

*Senator*,\* who also made numerous investigations upon the albuminous bodies in the urine, regards albuminuria as depending upon an abnormal circulation. The increase of tension which the vessels of the glomeruli experience during a general venous congestion, he thinks, is inferior in degree to that of all other capillaries, while at the same time the secretion is diminished by an accumulation of the secreted matters in the uriniferous tubules. In addition, a diminution of the arterial pressure,

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\* I. c.—für das Jahr 1874, Vol. I, p. 342.

as usually observed during venous congestion, occurs. Therefore, the albumen cannot be regarded as a product of filtration from the glomeruli, but is probably derived from the interstitial vessels bearing high pressure. In pure cases of amyloid degeneration, the urine voided from the Malpighian canals must be regarded as a mixture of a serous, non-inflammatory transudation, pressed through the glomeruli. The changes, occurring in the different forms of diffused, interstitial and parenchymatous nephritis in the urine, are depending upon the effects of the changed afflux and reflux of the blood in the vessels of the glomeruli, and in the interstitial vessels, and from those caused by the accumulation of secreted matters in the uriniferous tubules. The albuminous cylinders Senator regards as a product of a disturbance of nutrition of the epithelium.

*Heynsius*,\* who closely investigated the same subject, agrees with Senator in the following points: namely, that the albuminous bodies met in the urine need not resemble those of the plasma of the blood in all points; that the epithelium of the kidney undoubtedly possesses some influence over the secretion in general, and over that of the albumen in particular; and that the cylinders are not formed by transudation from the plasma of the blood, but are rather derived from the protoplasm of the epithelium.

The cause of albuminuria, he thinks, may be found not only in an increased venous pressure, but also in a diseased condition of the epithelium of the uriniferous tubules, in consequence of which the quantity of albumen, transuding through the vessels in the normal condition, is not consumed for the nutrition of the epithelium. The destruction of the latter, however, causes a diminution of the acid reaction, followed by an increase in the quantity of albumen.

*Birch-Hirschfeld*† adopts the view of Key, according to which the hyaline cylinders are probably formed by a secretion of the epithelium, while the granular cylinders are formed by a fusion of the degenerated epithelial cells.

*Aufrecht*‡ found that in the rabbit, after ligation of the ureter on one side, a granular turbidity of the epithelial cells in the

\* l. c. p. 243.

† *Birch-Hirschfeld*.—"Lehrbuch der Pathologischen Anatomy," 1877, p. 1038.

‡ *Virchow u. Hirsch*, Jahresbericht, etc., f. d. Jahr 1878, Vol. I, p. 222.

cortical substance of the kidney of the same side, associated with the formation of cylinders takes place, followed—about six days after the ligation—by a proliferation of cells in the interstices of the uriniferous tubules. He agrees with Oedmansson, Axel Key, Senator, and others, that the cylinders are formed by the irritated epithelial cells, and represent a secretion, which, in several instances, he has seen projecting from the cells.

Having thus briefly reviewed the leading theories on the formation of the albuminous cylinders, and, moreover, cited the particular views of some of the investigators, I shall now proceed to state my own observations on the subject. In the preceding description of the condition of the epithelium of the uriniferous tubules, the degree of degeneration in which the cells were found, was, as will be remembered, determined by the capacity of absorption which they showed for coloring matters. In accordance with this test, those least, or not at all, degenerated, exhibited a perfect staining, while others were more imperfectly colored, or had remained entirely colorless. These cells, moreover, without reference to the quantity of carmine absorbed, did not present any lustrous or glistening appearance, nor that intense color exhibited by the urinary infarctions. There are, however, a considerable number of others, as yet not mentioned, met with in all sections of yellow fever kidneys, which do present *the same intense color and glistening aspect as the infarctions*. They are particularly well exhibited in transverse sections of the uriniferous tubules in which the epithelium appears in the form of a ring, though they are also distinguished in others, or even in the entire tubule through the basement-membrane. In many instances, only a certain number of the cells, forming the ring, present this peculiar appearance (Fig. 9), though in others, all the cells of the epithelial ring appear affected (Fig. 10).

These deeply colored and glistening cells are not confined to any particular locality, but are met with in all portions of the tubules. Neither are they confined to particular cases, for I observed them in all the sections I examined, and without reference to the greater or lesser extent of the destructive changes in the parenchyma of the kidney. They were rather more frequently observed in the milder cases, in which the process of



degeneration was of a limited extent. In such cases, I also observed this characteristic appearance on a number of cells, lining some of the collecting tubules, and which showed no signs of atrophy or degeneration besides (Fig. 10, *a*), but had preserved their normal size and form. In some of these sections, no cylinders of notable size were found; those met with were contained in the smaller tubules and very short. In these instances, however, a number of transverse sections of the smaller tubules were also observed, in which not only the epithelial ring exhibited the deeply stained and glistening appearance, but in which the lumen was moreover filled with a cylinder (Fig. 10 *b*), presenting the appearance of being blended with the ring, such as was observed by Rovida in the uncolored specimen.

It will be obvious that these observations strongly corroborate the more recent theory, according to which the albuminous cylinders are a product of secretion from the epithelial cells of the uriniferous tubules, or may even be formed by a fusion of the degenerated cells themselves. Some additional remarks, however, will be required to render the probable correctness of this theory more comprehensible. It has already been mentioned that in many transverse sections of the albuminoid cylinders, unmixed with epithelial remains, the epithelium is found perfectly intact, and, though decreased in its normal thickness, nevertheless appears evenly colored, showing the absence of fatty metamorphosis. This fact has been advanced by *Weissgerber* and *Perls*,\* for the purpose of showing the fallacy of the theory in question, but loses its significance if explained in another way. These investigators probably supposed that if the cylinders were a product of secretion from these cells, the latter should still contain a portion of this product, and accordingly present the same yellowish and glistening aspect as the cylinders. This condition of things, it is true, may be conjectured, and I presume does, in some instances, exist, and may sometimes also be observed, though its actual observation is by no means essential; for, having observed the deep color and glistening appearance on the cells of collecting tubules—in some instances on the entire epithelial ring—which had preserved their normal turgescient form, I am

\* I. c.—*fuer das*, 1876.—Vol. I, p. 263.

inclined to regard this abnormal secretion as the initial stage of the degenerative process, followed, directly after the discharge of the secreted product, by the atrophy of the cells, before mentioned. It is, therefore, not essential that the cells surrounding a cylinder, representing the discharged product of their secretion, should in all cases still present the optical characters of this product; on the contrary, after the complete discharge of the secretion, they may not only resume their former appearance, but at the same time appear atrophied by the loss of material. But even if this supposition were wrong, there remain other probabilities of the cylinders being in truth a product of secretion; for it is not essential that this product should have come from those particular cells by which it is surrounded. On the contrary, it is more likely that it has been secreted from cells situated higher up, and, being at the time of secretion in a semi-fluid condition, has descended until arrested by the ensuing coagulation at another part of the tubule, in which the epithelial cells have not been similarly affected.

In some instances, as has been mentioned, the epithelium, generally surrounding the cylinder or infarction, has entirely disappeared, the latter being in direct contact with the basement-membrane. In these cases it may be presumed that these infarctions, consisting of epithelial remains saturated with the albuminoid matter, were probably formed in the place where they are found, while purely albuminoid cylinders are derived from cells situated higher up in the tubules.

It has already been noted that, in some instances, the minute vessels of the glomeruli were found filled with blood-corpuscles, showing that the congestion had extended throughout the whole capillary network of the interlobular vessels; generally, however, the vessels of the glomeruli were empty, and appeared normally colored; in a few instances they even appeared contracted, and the glomerulus diminished in size. In examining a considerable number of sections for the special purpose of discovering the peculiar condition of the epithelial cells above described, also on the layer of cells covering the vessels of the glomeruli, I only succeeded in observing in some parts of a few glomeruli the deep coloring and glistening appearance; besides this, I also met with

the segments of a few capsules, upon the inner surface of which an exudate, moderately colored by the carmine, could be detected. Another observation, however, quite as interesting, consisted in the presence of fat-globules, such as might be derived from a fatty infiltration, in a number of the cells of the covering epithelial layer of many glomeruli. These observations show that these cells also are prone to be affected in the same manner as those lining the uriniferous tubules.

As in the liver and stomach, so in the kidney, extravasations of hæmoglobin take place from the capillary vessels, to be absorbed by the epithelial cells of the uriniferous tubules. Almost in every section of yellow fever kidney, some traces of free hæmoglobin, recognized in carmine preparations by their peculiar brown color before mentioned, may be observed in any portions of the tubules. Sometimes the extravasation is observed in a considerable number of neighboring tubules. The pigmentation, however, is not confined to the formless hæmoglobin, for hæmatoidin in granular or crystalline form is also met with. Hæmatoidin crystals, especially, are frequently seen upon the inner surface of the epithelium, generally collected in small groups or masses of very minute crystals, though in one particular case I also observed numerous granules of hæmatoidin in the interior of a number of empty uriniferous tubules. The brown color which the epithelial cells assume by the absorption of the hæmoglobin, of course, differs in intensity in different localities, according to the quantity absorbed. These extravasations are not limited to kidneys extensively degenerated, but are equally observed in cases presenting only slight traces of the degenerative process.

As far as my experience extends, there is no product of inflammation found in the yellow fever kidney. Although I had, in every section examined, my attention directed to this point, I failed to discover any trace of such a product, either in the vicinity of the connective tissue capsule, or in the interstitial tissue. Therefore the destructive changes occurring during the course of yellow fever, in the parenchyma of the kidney, are the result of hyperæmia.

In conclusion, I may remark that no traces of bacteria, or other minute organisms, could be discovered in this organ. If such

organisms were really present in the kidney, as has been erroneously stated, we should most probably find them in the minute blood vessels, or in the interior of the uriniferous tubules. But not a single specimen, or colony, have I met with in these localities in the very numerous sections which I have examined. And if ever these organisms are met with in these places, a close investigation will certainly show that they were developed along with the decomposition of the body, or of the kidney itself, after its removal from the former. In one exceptional case only, I observed upon a section, mounted in Canada balsam, one or two granular patches, representing colonies of minute micrococci. A change of the focus, however, showed that they were not contained in the preparation, but were simply resting upon its surface, where they had been developed after the section had been cut, an accident which probably occurred in the staining fluid, or while the sections were kept in a mixture of alcohol and water, previous to the process of mounting.

#### THE SUPRA-RENAL BODIES.

These organs, of which the true function is, as yet, not known, are in fatal cases of yellow fever almost invariably found to have undergone certain pathological changes. To render a description of these changes more perspicuous, we may, as before in some other instances, briefly review their microscopical anatomy.

As in the kidney, so in the supra-renal bodies, a "cortical" and a medullary substance have been recognized—though here no secretory ducts exist, but both substances consist of minute blood vessels and cells, supported by a fine reticulated network of connective tissue. This network originates by certain septa, or processes, arising from the inner surface of the general capsule of the organ, whence it extends throughout the parenchyma, to be finally connected with the adventitia of the veins, which leave the organ through its hilus. The blood-vessels of the organ are very numerous, and represent branches of the aorta, and of the phrenic, coeliac, and renal arteries, which, after penetrating the capsule, subdivide into numerous minute branches, terminating in the capillaries of the cortical substance. Three distinct layers of cells are distinguished in this substance. The middle one of

these layers truly represents the bulk of the cortical substance, while the outer and inner ones only appear as narrow borders. The inner layer blends with the adjoining medullary substance. The cells, which are polygonal or round in form, occupy the space between the septa in the form of larger or smaller groups or columns. In the outer and inner layer, these groups, in accordance with the smaller and rounder meshes of the reticulum, are small and of a roundish form, while in the middle layer, in which the meshes are larger and much longer, the groups of cells assume the forms of columns. The medullary substance consists of a reticulum of very delicate connective tissue, with small meshes, filled up by small groups of polygonal or stellated cells, containing large nuclei. The capillaries, differing in their caliber in the different localities of the parenchyma, generally follow the septa and columns of the reticulated connective tissue, and, accordingly, the form and size of their meshes correspond with those of the meshes of the reticulum. Their caliber is of a medium size in the cortical substance, but in reaching the medullary substance, in which they represent a network with small meshes, they considerably enlarge in diameter, and many of them even present dilatations. In the latter network, the venous radicles take their origin. The nerves in the supra-renal bodies are very numerous; they are derived from the semi-lunar ganglion, the renal plexus, and the phrenic and pneumogastric nerves, and, after having entered the organ, are chiefly distributed to the medullary substance, forming plexuses in connection with which ganglion-cells have also been observed. The pathological changes observed in the supra-renal bodies resemble those taking place in other organs already described, consisting in the infiltration of fat and hæmoglobin, derived from the blood, and preceded by hyperæmia of the organ. In most cases, therefore, the examination of thin microscopical sections shows the capillaries filled with blood-corpuscles, especially those larger ones extending through the medullary substance, though in a number of cases I also observed the others, particularly those of the outer layer of the cortical substance, congested. The fat-globules, resulting from the fatty infiltration, are quite large, and are found in the cells of both substances, though perhaps to a greater extent in the cortical.

The infiltration or extravasation of hæmoglobin absorbed by the cells is greater and more general here than has been observed in any other organ. Almost in every case examined, it involved the whole medullary substance, from which it extended into the inner and middle layer, sometimes even into portions of the outer layer of the cortical substance. The degree of this pigmental infiltration is sufficiently great to be always distinguished by its brown color in sections of fresh specimens; in some cases, even, it appears dark brown. In sections, stained with carmine, the infiltrated cells exhibit the characteristic brown color of the extravasated hæmoglobin, already referred to. Besides the fatty and pigmental infiltration met with in every specimen examined, I moreover observed, in some cases, that a process of atrophy of the parenchymatous cells, particularly those of the medullary substance, had also been going on. In some cases, even, the atrophy was associated with softening of this substance, which presented a dark brown color; the softening process had given rise to a cavity in the organ. The atrophy appeared to be chiefly confined to the protoplasm of the cells, the nuclei remaining unaffected.

For the sake of comparison, I prepared a number of sections of supra-renal bodies taken from several cases representing other diseases than yellow fever, such as of the heart, liver, kidneys, and lungs. In these sections, a trace of pigmental infiltration was detected, but too insignificant to be in any way compared with that observed in yellow fever, as it was entirely limited to a very narrow yellowish brown stripe, representing the inner border of the cortical substance.

Although a number of pathological conditions and structural changes, such as hypertrophy, atrophy, fatty and amyloid degeneration, suppurative inflammation, carcinoma, tubercle, cysts, and even extensive hæmorrhages in the interior of the organ, have been observed to occur in the supra-renal bodies, I have thus far seen no record of an infiltration of hæmoglobin into the parenchyma in such a marked degree as I have observed to take place in yellow fever,—a phenomenon to which some special significance regarding the normal function of these organs might be attached, if it was not simultaneously observed in the liver, stomach, and kidney. For this reason, it must be regarded, as



in the other cases, depending upon the hyperæmic condition of the vessels, retarding the circulation of the blood through the latter. The fatty infiltration, also, is evidently due to the same general causes, from which it depends in the other organs already mentioned.

#### THE CEREBRO-SPINAL AXIS.

*The Pia Mater.*—In connection with the macroscopical examination of the organs after death, I stated that this membrane, as far as it extends over the brain, was almost invariably found in a state of hyperæmia, and that, in many cases, not only the veins, but also the arteries were found filled with blood. The microscopical examination reveals the same condition in the minute vessels, the arterioles, venules and capillaries. In examining, therefore, a small piece of pia mater, carefully removed from the cortex cerebri, these vessels, with only a few exceptions, are, in most instances, found more or less filled with blood corpuscles; in some of them, even, the corpuscles are crowded to such an extent as to have lost their original form by the mutual pressure which they had exerted upon each other. In removing the pia mater, the minute vessels entering the substance of the brain are, of course, torn, causing the blood corpuscles which they contain to escape. The stumps of these vessels, appearing like villi, and attached to the inner surface of the membrane, are usually found empty. Notwithstanding the intense hyperæmia which appears to have existed during life in many portions of the pia mater of the brain, I have, with one single exception, failed to detect any exudation cells in the vicinity of the vessels, or any increase in the connective tissue cells of the membrane, which might have indicated the pre-existence of inflammation,—a fact, which clearly shows that the cerebral phenomena observed at the bedside, are the results of a simple though severe hyperæmia. In the one exceptional case, the connective tissue cells had just commenced to undergo a division, resulting in a small group of three or four cells, or only nuclei, in the place of the old ones (Fig. 17). In some cases, I have observed that the walls of a number of arterioles, especially of those which are empty, or containing but few blood corpuscles, presented a corrugated or wrinkled appearance. As the wrinkles were confined to the

adventitia, they appear to have been caused by a contraction of the delicate muscular fibers, encircling these small vessels. If this be the true cause, the contraction must have occurred before death, or during the agony of death itself. But there is another pathological condition, which, in fully one half of the cases examined I observed to have taken place in these minute vessels, both arterioles and venules, and which consisted in a fatty degeneration of their nuclei, especially of those belonging to the adventitia. In most of these instances, the nuclei have disappeared, leaving a group of smaller or larger fat globules in their places. In other instances, an increase in the mere trace of protoplasm, found in connection with the nucleus in its normal condition had taken place, causing a thickening of the wall of the minute vessel, and giving rise to a capillary aneurism, or, by its proneness to degeneration, even to a final rupture followed by hæmorrhage. The small hæmorrhagic effusions, observed in some of these cases, may have been owing to this cause.

The arachnoid membrane, as before stated, is very frequently found not only opaque, but also thickened. This condition is caused by an exudation of a finely granular matter into the subarachnoid space, filling up, at the same time, the meshes of the connective tissue of the pia mater. The granules of which this substance is composed, are quite distinct, but pale, and measure about  $\frac{1}{1300}$  mm. in diameter. In the pia mater of some cases, and mostly in the close vicinity of a vessel, or associated with a minute hæmorrhagic effusion, smaller or larger brownish looking granular masses of irregular form, are here and there observed. The granules of these masses are identical with those of the exudate before mentioned, though they appear more distinct, which is probably owing to the presence of free hæmoglobin, imparting the color to the mass. A number of similar, but colorless granular accumulations are moreover observed in the spaces between the vessels. It is quite probable that these accumulations represent minute portions of granular substance from the upper stratum of the cortex cerebri.

The hyperæmia of the pia mater is not confined to those portions of the membrane covering the cerebrum and the cerebellum, but, moreover, extends over the pons varolii and medulla oblon-

gata, frequently even as far as the cervical enlargement of the spinal marrow. In many cases, the congestion of the vessels of the pons and medulla is greater than that of the central vessels.

While in the cervical and dorsal regions, the pia mater of the spinal marrow is generally found free from congestion, its vessels are almost always found filled with blood corpuscles in the lumbar region. This fact can be sufficiently demonstrated in thin sections of spinal marrow from this region, in which the minute vessels of the membrane, with those that enter the spinal marrow, are observed filled with blood corpuscles.

*The Substance of the Brain.*—As it may well be asserted, that in yellow fever the safety of the patient almost entirely depends during the febrile stage, and after, upon the particular condition of the nervous system, especially the brain, an exact knowledge of the pathological changes taking place in this organ, are most important. And, judging from the traces of intense hyperæmia, met with in almost all fatal cases in the pia mater, as above described, we may well expect to find a similar condition in the substance of the brain. The pathological condition of this organ may be studied to the greatest advantage in large thin sections, passing through the whole extent of its different parts. The examination of a very great number of such sections revealed to me that, in almost every case examined, the hyperæmia extended from the pia mater *throughout* the substance of every portion of the brain. Not only the arterioles and venules were found filled with blood corpuscles, but also the capillaries. In most instances, the blood corpuscles are crowded in the arterioles and venules, and to such a degree as to have lost their normal form by their mutual pressure. In the pons varolii and medulla oblongata particularly, the vessels are invariably found filled with blood corpuscles, inducing me to regard these parts as special seats of the congestion. In some cases, I have even found opacity of the pia mater covering these localities. In those cases in which there was fatty degeneration of the arterioles and venules of the pia mater, this process is observed to have extended to the same minute vessels of the brain substance. In some cases, even, I observed traces of commencing degeneration in a considerable number of ganglion cells, especially on those of

the cortex cerebri, but also in the medulla oblongata. While in a normal ganglion-cell, namely, the double contour of the nucleus, and the outlines of its granules and those of the protoplasm of the body, generally seem distinct, they here appeared indistinct, and the whole ganglion cell presented a fatty luster. This condition is best observed in uncolored sections, examined in water or glycerine. In one case, I observed that though the outlines of these anatomical constituents of the ganglionic bodies of the cortex cerebri had been well preserved, their protoplasm had undergone atrophy, reducing their size. Notwithstanding the occurrence of extravasations of hæmoglobin in every other organ examined, the pia mater not excepted, as I have shown before, the substance of the brain appears to be remarkably free from this pigmentary infiltration; neither were in all the cases examined microscopically—about a dozen—capillary hæmorrhages met with.

As regards the *spinal marrow*, there are, aside from the congestion of the vessels of the pia mater above mentioned, no pathological changes observed in the nervous elements.

#### THE GANGLIA OF THE SYMPATHETIC NERVOUS SYSTEM.

The microscopical examinations which I made on these ganglia, embraced a very considerable number of sections, made of the *first thoracic*—*G. stellatum*—and the *semi-lunar* ganglia of six cases. In the majority of these cases, the minute blood vessels of these ganglia were found filled with blood corpuscles. In two cases, the ganglionic bodies of the first thoracic, as well as of the semi-lunar ganglion, had most obviously undergone degeneration. In the greater part of these ganglion cells, the nuclei had entirely disappeared (Fig. 16), leaving no other trace but their nucleoli, which appeared very distinct; in the rest, *very faint* outlines of the nuclei could be still observed. The bodies of all these ganglion cells presented an indistinct appearance, and were characterized by a peculiar fatty luster, even observed on specimens mounted in Canada balsam. As there were no fat globules observed in the places of the nuclei, it is difficult to account for their disappearance, unless it was caused by a process of atrophy, such as was observed to occur on the epithelial cells of the

uriniferous tubules. In a third case, I observed an abnormal accumulation of pigment in a considerable number of ganglion cells of the semi-lunar ganglion. In the three remaining cases, nothing specially abnormal could be detected on the ganglion cells.\*

The preceding description of the pathological changes taking place in various organs and tissues in the course of yellow fever, is based upon very numerous and careful examinations, made during former epidemics, but particularly upon the abundant material which I collected during the epidemic of 1878. In the pursuit of these studies, portions of the organs were examined in their fresh condition directly after the autopsy, while the rest were put into a simple solution of bi-chromate of potassa, or into Mueller's fluid. A few days later, after the tissue had been slightly hardened, the examinations were repeated upon thin sections made by the free hand; but after they had attained the proper consistency, larger and perfect sections were made by the aid of the microtome. These, finally, were carefully prepared, stained, and mounted in Canada balsam or glycerin, in order to serve for the more thorough final studies.

The amount of material which I have in this manner examined and studied is very great; it embraces the various organs of twenty-three cases out of the thirty autopsies which I made during the epidemic of 1878, and those of an additional most interesting case in 1879. I have made more than two thousand thin sections, ranging from the larger ones, passing throughout an entire hemisphere of the cerebrum to the smaller of the sympathetic ganglia, or the mucous membrane of the stomach. The

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\* In the "Report of the Havana Yellow Fever Commission of the National Board of Health," it is stated that in the semi-lunar ganglion "connective tissue of new formation is met with to a greater extent than in the tissues heretofore described, but the nervous elements present no evidence of degeneration further than the cloudy swelling already described in other organs; while of the other portions of the nervous system which have not been examined microscopically, it may be said, that they present nothing abnormal to the naked eye."

The discrepancy existing between these statements and my own observations, I can only explain by presuming that the pathological expert of the commission took the very numerous nuclei, belonging to the capsules, and to the intricate extensive plexuses of sympathetic nervous fibrillae connecting the ganglionic bodies, or to the bundles of sympathetic nerve fibers arising from them, for newly formed elements. As regards the report of the condition of the other portions of the nervous system, I could only infer that the type of yellow fever at Havana must differ from that observed at New Orleans.

sections of the brain are especially numerous, comprising all parts of the organ, and representing a considerable number of cases. About one thousand of these sections, taken from different organs, I have mounted in Canada balsam or glycerin, a large portion of them being in the possession of medical friends in New York, Philadelphia and Chicago, while the rest remained in New Orleans.

A word concerning the mounting and examination of these or similar specimens may be advisable here, as their successful study much depends upon the medium in which they are examined. Thus, though the mounting in Canada balsam is the most substantial and beautiful for colored sections of tissue, there are nevertheless certain disadvantages connected with this medium, and depending upon its high degree of refractibility. This is the case with tissues that have suffered fatty infiltration or degeneration, in which the fat globules, by the too great amount of light passing through them, are rendered quite indistinct, and difficult of recognition. For this reason, it is better to examine and mount such specimens in a less refractive medium, such as glycerin. In examining stained tissues, mounted in balsam, they should not be too brilliantly illuminated, as too much light will render indistinct the image of structure, though it shows well the image of color. It is more advantageous, therefore, to use the plane mirror and a small diaphragmatic opening for the sections mounted in balsam, while the glycerin sections may be examined with the concave mirror. I need hardly mention that examinations of this kind should only be made with the very best first-class objectives, as an inferior objective does not show the details in their true light.

[TO BE CONTINUED.]

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THE Minnesota State Medical Society will hold its annual meeting at St. Paul, on Tuesday, June 20, 1881. The profession is respectfully invited to add to the interest and value of the meeting by being present. ALEX. J. STONE, M.D., *President*.



## Clinical Reports.

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### ARTICLE V.

#### SURGICAL CLINIC OF PROF. EDMUND ANDREWS.

##### *Litholapaxy.*

It is doubtful whether Prof. Bigelow is justified in coining this new name for a mere modification of lithotripsy. It is best to be very slow to inflict new technical terms upon the memory of students.

The word is compounded from the two Greek terms, *lithos*, a stone, and *lapaxis*, the action of purgative medicines on the bowels. Literally it would mean "stone-purging." The essence of the operation consists in removing the whole stone at one operation, instead of doing it little by little at several sittings. For this purpose Prof. Bigelow has devised a wash bottle and tubes far superior to those of Mr. Clover, and by the great size of his tubes immensely facilitates the evacuation of the fragments. He has also modified the lithotrite, so that it enters the bladder easier, crushes the stone faster, and is less liable to pinch the folds of the bladder, than the old instruments. Nevertheless his operation has hitherto found little favor among Chicago surgeons, but for my part, believing that small stones in adults ought generally to be removed by crushing rather than cutting, I am prepared to look favorably on Bigelow's plan in many cases, for I have had so much experience in the vexations of slow lithotripsy, that I rejoice heartily in any improvement that can combine the safety of lithotripsy with the promptness of lithotomy. The following cases occurred at the clinic during the past month:

*Case 11,348.*—This patient was admitted in excellent general

health, so that his system scarcely required any preparation. Ether having been administered, the large lithotrite of Bigelow was introduced, and the scale on the staff, after the stone was seized, showed it to have the diameter of two and a half centimeters, or about seven-eighths of an inch. In twenty-five minutes the stone was so completely crushed and washed out, that not the smallest particle could be found by a delicate searcher with the auscultating attachment. In order to introduce Bigelow's large tubes it became necessary to incise the meatus, when they entered without difficulty, and their great superiority over the smaller tubes of Mr. Clover was strikingly manifest. The crushed stone seemed to be sucked up and brought out with the sweep of a small maelstrom.

The patient, on awaking from his ether, declared he had not been so comfortable for months, and could hardly be kept in bed the rest of the day. The following morning he got up in spite of remonstrance, declared that he was perfectly cured and wanted to go home. I explained to him that it was necessary to stay and be sounded a few times to make sure of the completeness of the operation. This pacified him for a few hours, but in the afternoon he declared that he *knew* his cure was complete, and that he never felt better in his life; so, suiting the action to the word, he marched to the depot and took the cars for home.

This imprudent course caused no injury, so far as I can learn, but it is not to be recommended to others for imitation. The case, however, showed in a striking manner how much superior rapid lithotripsy is in some instances to either slow lithotripsy, or to lithotomy.

*Case 11,367.*—This patient entered with a stone which, when grasped by the lithotrite, measured eight millimeters in diameter, or about a quarter of an inch. Notwithstanding the small size of the calculus, the bladder was more sacculated and irritable than in the former case. The urethra was small, and even after incision of the meatus would not admit Bigelow's large tubes. As the patient could not stay for gradual dilatation, I proceeded by attaching Mr. Clover's tubes to Bigelow's energetic wash bottle. The inferiority of the Clover tubes was manifest, and though the crushing was readily effected, the operation lasted under ether

thirty-five minutes. In both patients Bigelow's splendid lithotrite showed its superiority to those of Sir Henry Thompson, and of Sir William Ferguson. It seizes easily, and with the least possible liability of grasping the folds of the bladder between the jaws.

The patient awakened and had no shock or chill. He was tractable, lay in bed a few days as ordered, and, after being resounded to determine the completeness of the operation, went home cured on the sixth day.

#### TURPENTINE TO PREVENT VOMITING UNDER ETHER.

There has been a statement going the rounds of the profession that a dram of spts. turpentine in each pound of ether will prevent anæsthetic vomiting. Hoping to derive advantage from this plan, I had the ether used at the clinic terebinthinated for a time, and a record of the results kept to compare with those of the non-terebinthinated article. The comparison resulted as follows:

Total number anæsthetized during the experiments, 102; patients taking pure ether, 31; number who vomited, 6; per cent. vomited, 19. Patients taking terebinthinated ether, 71; number who vomited, 21; per cent. vomited, 30.

It appears, therefore, that of those who took pure ether, only nineteen per cent. vomited, while of those who took the turpentine and ether, thirty per cent. met that accident. It is needless to say that the turpentine was ignominiously expelled from the clinic. No. 6, Sixteenth street, Chicago.

E. A.

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STUDY OF CAUSES OF CONSUMPTION.—Dr. Edward Playter, of Toronto, Ontario, has undertaken a systematic study of the causes of consumption. As an aid in this study he requests members of the profession having well-marked cases of consumption now under treatment to send him their address, in order that he may send a list of questions concerning the consumptive patient to which he wishes replies. A study based on a sufficient number of replies must yield valuable results.

## Society Reports.

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### ARTICLE VI.

ILLINOIS STATE MEDICAL SOCIETY. Thirty-first Annual Meeting held May 17, 18 and 19, 1881, in the Methodist Church Block, Chicago. Dr. George Wheeler Jones, of Danville, President, in the chair; Dr. S. J. Jones, of Chicago, Permanent Secretary.

#### FIRST DAY—MAY 17.

This was one of the largest meetings ever held by the Society, whose membership numbered 114, but the audience was reinforced by an unusually large number of visitors from the city, and this and other states. The

#### PRESIDENT'S ADDRESS

was decidedly conservative in character, and strong in its denunciation of the many abuses which had crept into the profession at large. Effectual medical legislation seemed an almost impossible achievement, and he denounced the present medical training as inadequate to the exigences of modern practitioners of medicine, and advised a graded system of education.

The report of the Committee on Practice of Medicine was read by the Chairman, Dr. E. P. Cook, of Mendota. It covered the time from May, 1880, to the date of this meeting, and consisted of reports from the various parts of the State. It was thought that no important phase of any epidemic had been overlooked, but there was much difficulty in getting the particulars of each, and a more efficient form of correspondence ought to be established between the various members. The appointment of correspondents from the local societies through Illinois might answer this purpose. Nothing unusual had happened until October,

1880, except a slight increase in malarial diseases, but from that time these and many other zymotic diseases had prevailed to quite an extent. The protracted winter from which we had just emerged was doubtless a powerful factor in their causation. The southern part of the State had been more favored. The measles prevailed in every county. Scarlatina and diphtheria prevailed in an epidemic form in some of the central and northern counties. Cerebro-spinal fever complicated some cases of measles. Small-pox had extended from Chicago to most parts of the State. Pneumonia had also been unusually frequent, and an epidemic of dysentery had been observed. The mortality from whooping-cough, and that from erysipelas had been greater than usual. Winter cholera had prevailed in Chicago; it was so mild as to escape the observation of many. A few cases of trichinosis had been reported, but probably many more had been overlooked, as was generally the case.

Report of Dr. Charles T. Parkes, of Chicago, Chairman of the *Committee on Surgery*.

#### TREATMENT OF WOUNDS.

Free drainage, close coaptation, and perfect rest are requisites. The first was obtained by the use of rubber tubes, or what was better, absorbable tubes made of chicken bones. Silk-worm guts form an advantageous substitute to horse hair in capillary drainage. To insure coaptation, the cat-gut ligature was very good, but as it was soon absorbed it might give rise to secondary hæmorrhage, and torsion was still preferred in some hospitals in the arrest of hæmorrhage. Cat-gut soaked fourteen days in one part of chromic acid to thirty of glycerine was so hardened as not to be so readily absorbed. Silk-worm guts were a good substitute. Rest of a wounded limb should be secured by the use of splints in some cases.

Listerism was now adopted by most of the younger surgeons, and when the spray was dispensed with, the washes with carbolic acid solutions were used. Lister's dressing also contributed to insure perfect rest of the wounded parts. The presence of bacteria in suppurating wounds had been often detected, and when injected into healthy tissues gave rise to abscesses, but under the use of the spray, these bacteria had disappeared from wounds.

The dressings should be renewed often enough to prevent any irritation to the parts from retained fluids.

#### VARICOCELE.

The treatment of this disease was very unsatisfactory, frequent cases of death or of permanent injury occurred, and Dr. R. G. Bogue had made quite a departure from the common treatment, in opening the scrotum antiseptically, ligating a part of the veins at a time with cat-gut, and closing the wounds. This had given most satisfactory results, and could be applied also to varicose veins in any part of the body.

#### NERVE RESECTION AND STRETCHING.

The Chairman had made an efficient resection of the ulnar nerve in two instances, and sensation and motion were re-established after the extremities of the nerve had been pared and brought together with cat-gut ligatures. Nerve stretching was considered a favorable operation in neuralgias, tetanus, epilepsy, locomotor ataxia, and other diseases. Experiments to ascertain the tension of nerve trunks in men were made on recent subjects, with the following results: Eighty pounds break the ulnar nerve; 57, the median; 18, the radial; 61, the brachial;  $7\frac{1}{2}$ , the facial; 200, the great sciatic; 92, the cauda equina. Dr. Parkes thought he had been the first to institute such experiments.

A case of non-union after a compound fracture of the tibia in an old man, had come under the observation of Dr. D. S. Booth, of Sparta. The foot was useless and amputation seemed proper.

Dr. W. A. Byrd supplemented the report on Surgery with some very interesting cases. In one he had trephined into the frontal sinuses of a patient, and removed some decayed bone which had caused a supra-orbital neuralgia of fifteen years duration. He had made tracheotomy without a tube, replacing it by wires. He related a new method of nerve section in facial neuralgia, and exhibited some surgical instruments remarkable for their simplicity, cheapness and usefulness.

*Committee on Obstetrics.*—Dr. H. Webster Jones, Chairman, read the report of that committee, and said that the accoucheur should inspire confidence, he should palliate suffering, supplement nature, and attend to any complication. His hand was the best uterine dilator. Forceps should not be used unless strongly indi-



cated. Long delay in labor was a common cause of inflammation and blood poisoning. The delivery of the placenta should be facilitated by placing one hand over the uterus externally. A careful examination should be made six weeks after parturition to satisfy the accoucheur as to the integrity of the various organs of generation.

Dr. De Laskie Miller laid great stress on the necessity for the accoucheur to be learned and skillful. He gave some rules for dilating the os with the fingers and tearing any adhesion of the membranes to the uterus. He said that rupture of the perineum could be avoided if the attendant had a proper knowledge of the anatomy of the parts, and made sufficient support.

Dr. J. W. Dora read the report of the *Committee on Gynecology*.

He complained that this is the only specialty which was not practically taught to students. He hoped for the time when false modesty would no longer interfere with clinical demonstrations. He denounced several modes of treatment which had been fashionable in their days and caused many bad results. His treatment of obstructive dysmenorrhœa consisted in making an incision and introducing sponge tents dipped in a carbolic acid solution. It needed to be used repeatedly, but it would generally prove successful. He gave rules for the treatment of rupture of the perineum.

Dr. Ellen A. Ingersoll read a supplementary paper on *Dysmenorrhœa*.

It was often caused by displacement, but the majority of cases could be referred to a congestive condition of the uterus. It was liable to occur soon after the age of puberty, and to disappear after repeated pregnancies. The general health was often below par. The function of the liver in excreting cholesterine, the detritus of nerve substance, was ill-performed in those cases, and constipation was a frequent accompaniment. Mercurials were especially suited to these. Alteratives, tonics, and hygienic measures were beneficial. For an immediate relief German chamomile, aromatic spirits of ammonia and viburnum were as good as any other remedy. The introduction of a sponge tent a few days before the return of the menses prevented dysmenorrhœa.

## SECOND DAY—MAY 18.

Dr. F. C. Hotz, of Chicago, read the report on *Ophthalmology and Otology*.

Overdoses of quinine had produced blindness as well as deafness. In a case of keratitis, quinine had brought relief after local treatment had proven useless. Homatropine was an efficient dilator of the pupil, and its effects soon passed away. The report was unfavorable to the audiphone. Dr. Hotz gave the particulars of a case of malarial otitis which subsided after the use of quinine in scruple doses. Enucleation of the eye-ball could not be replaced by section of the nerves, as these would unite soon and sympathetic inflammation would continue.

*Committee on Dermatology.*—Dr. W. J. Maynard, of Chicago, read the report. His subject was ring-worm of the scalp. Its proportion to other diseases was one to thirty. Its diagnosis required time and skill, and so its treatment. It was quite liable to cause baldness. Ring-worm of the body was a common affection, but it passed unobserved. The type of the disease was lost after some time, and would readily be mistaken for eczema. The cause of the disease was a microscopic organism, which gave rise to the same in some of the domestic animals. The best treatment consisted in mercurials, sulphurous acid, iodine and carbolic acid. Epilation was necessary in many cases, and this was done with large forceps. Iron, arsenic, iodide of potassium were given internally with cod-liver oil.

Dr. C. T. Reber, of Shelbyville, reported two cases of submucous fibroids complicating pregnancy. There had been abundant hæmorrhage in both cases, but they had reached full term.

Dr. W. S. Caldwell, of Freeport, read a paper on the management of the after-birth in abortion. No great amount of hæmorrhage should be allowed, but the hand or the fingers should be introduced and the placenta removed. He did not commend the use of placental forceps, nor the administration of ergot. He had used the tampon and laminaria tents successfully in some cases.

Dr. E. Fletcher Ingals, of Chicago, read a valuable report on *Laryngeal Tumors*, which appears in full in this number of THE CHICAGO MEDICAL JOURNAL AND EXAMINER.

Drs. Truesdell and Whitmire recommended the use of the carbolic acid inhaler in chronic laryngitis and other affections of the air passages.

#### ANIMAL HEAT.

Dr. J. H. Hollister, Chicago, read an able paper on that subject. Heat was produced by the vital activity of the animal as much as by chemical changes taking place in the tissues. There was more heat generated in health, but its retention in disease gave rise to fever. He believed there were vaso-dilator nerves, whose primary center was situated in the medulla oblongata, which some medicines influenced, thereby diminishing heat. He also enumerated the various results of a high temperature. Withdrawing food, applying cold to the surface of the body, and administering some cardiac sedatives, reduced the temperature in fever. The cold pack, sponge bath, and ice internally, were especially recommended.

Dr. Hill, of Bloomington, exhibited an instrument invented by Dr. Russell, of Bushnell. It resembled a trocar and canula and was to be introduced into the trachea to replace tracheotomy.

Dr. Maxwell read a paper on *intra-capsular fracture*, and reported what seemed to be two cases of that injury in his own practice. He had made extension in the direction of the limb, and he had made extension transversely. He had also elevated the bed at the foot and on one side. The treatment had also been successful in both cases, and union was perfect.

#### SPECIALISM IN MEDICINE.

Dr. A. Reeves Jackson, of Chicago, said, in an able paper with the above title, that specialism was nothing new. That there were physicians in ancient Egypt who made a specialty of the treatment of the liver, the skin, the head, and the toe-nails. Multiplicity of professorships and a lack of medical education were the chief causes of specialisms. The consciousness of knowing very little of general practical medicine leads the graduate to work a specialty for himself. He remonstrated against the theoretical teachings of the various colleges, and said that medicine was chiefly an art which could be learned through practice only.

The advantage of specialism was that by concentrating it increased one's energy in a certain direction; that all great men had been specialists, and that it was for such a division of labor that medicine had progressed so rapidly of late. He called professional quacks those that studied a special branch before they had been general practitioners. These would be especially liable to refer all diseases to one organ in particular. His conclusion was that specialism reduced the number of general practitioners without diminishing the practice of the latter, and specialists relied on the profession for its support, but they must have been good common physicians before entering the field of specialism.

Dr. Earle read an article on r  theln, an abstract of which appeared in the last number of THE JOURNAL AND EXAMINER.

Dr. Roswell Park reported 100 cases of the same disease which had come under his observation at the Orphan Asylum.

#### THE LEGAL REGULATION OF THE PRACTICE OF MEDICINE.

Dr. M. A. McClelland, of Knoxville, had prepared a report on the above subject, which was read by the Secretary. It was a statement of the various attempts at making efficient legal regulations, with as many failures.

#### INFECTIOUSNESS OF TUBERCULOSIS.

Dr. H. Gradle summed up the late experiments made to ascertain the contagiousness of tuberculosis in rabbits. There was no doubt as to the relationship between scrofula, tuberculosis, and fungous arthritis. The incubation of the disease in rabbits was twenty days. Tuberculosis is probably often transmitted through the breath of the patient. A solution of tuberculous matter in a spray inoculated the disease in dogs in the space of three weeks. In all probability the virus was a micro-organism.

Dr. E. F. Ingals said that it was a matter of surprise to him that the relations of bacteria to tuberculosis had not yet been determined. He had no doubt as to the contagiousness of tuberculosis, but he thought another decade would pass before the character of this contagion could be ascertained.

#### USES AND ABUSES OF ALCOHOL.

Dr. E. Ingals read a report made up of the opinions of most of the prominent members of the Society. Most of them agreed

that alcohol should never be used except as a remedy. That in some cases it was one of the best articles in the Pharmacopœia, and a good stimulant. It was a narcotic poison and an anæsthetic in large doses. Drunkenness was a vice of advanced civilization, which should be combatted by the example and the principles of the medical profession.

#### THIRD DAY—MAY 19.

The first paper in order was one on Chian Turpentine, by Dr. E. Andrews, of Chicago. This remedy had proved useless in the treatment of any variety of cancer. A great many cases of cancer of the womb, of the breasts, etc., all of them following the usual course of the disease, were related, and the conclusion was reached that Chian turpentine did not deserve a better place than any other remedy in the therapeutics of cancer.

#### EPILATION.

Dr. Plym. S. Hayes, of Chicago, read an interesting paper on this subject. He claimed the best depilatory was electrolysis; which he performed thus: A needle was attached to the negative pole and plunged into the hair follicle, the hair being held by forceps; the other pole was placed near the spot, and the current destroyed the hair follicle. It required little traction to pull the hair, which could never grow again. This process was not painful, the electrolysis caused some anæsthesia of the parts. It seldom needed to be repeated.

#### ANATOMY OF THE SHEATHS OF THE PALMAR TENDONS.

Dr. Roswell Park read a contribution with this title, an abstract of which was printed in the last number of THE JOURNAL AND EXAMINER.

#### LISTERISM AND CARBOLIC ACID.

Dr. C. Truesdell read a report largely composed of the views of many surgeons on this subject. He reported a case of mummification of the finger from pure carbolic acid. It had been painless. He thought this remedy serviceable, especially on account of its antiphlogistic properties, and considered it the best local application to wounds and ulcers. Dr. J. P. Johnson, of Peoria, had used phenol with as good results as carbolic acid. He was especially

gratified with the use of carbolic acid as a cauterizing agent. It possessed the great advantage over all other acids that it is painless in its application. He had cured ulcers in this manner, and had successfully treated endometritis by the application of carbolic acid to the inside of the uterus. He was in the habit of applying it with a stick fashioned as desired.

The Committee on State Register had been satisfied that the Register of the State Board of Health entirely fulfilled the wants of the Society. The committee was discharged.

The Treasurer's report showed a very prosperous condition of affairs.

The *Committee on Necrology* reported the death of Dr. F. H. Davis, son of N. S. Davis, of Chicago.

A resolution was passed providing that members who had paid their annual dues during fifteen years should not be suspended for non-payment of the same in the future, but that they would not be entitled to the Annual Transactions.

A paper on "Drainage of Cavities in the Lungs," by Drs. C. Fenger and J. H. Hollister, of Chicago, was presented to the Society, and referred to the Committee on Publication, with all the other papers read before this meeting.

#### ELECTION OF OFFICERS FOR THE PRESENT YEAR.

*President*—Dr. Robert Boal, Peoria.

*First Vice President*—Dr. A. T. Darrah, Tolono.

*Second Vice President*—Dr. Ellen A. Ingersoll, Canton.

*Treasurer*—Dr. J. H. Hollister, Chicago.

*Secretary*—Dr. W. A. Byrd, Quincy.

*Committee of Arrangements*—Drs. Jas. Robbins, J. T. Wilson, F. Drude, J. A. Wagner, M. F. Bassett.

#### STANDING COMMITTEES.

*Practical Medicine*—Dr. W. D. Ensign, Rutland, Chairman; Dr. John Wright, Clinton; Dr. H. T. Godfrey, Galena.

*Surgery*—Dr. E. W. Lee, Chicago, Chairman; Dr. D. W. Graham, Chicago; Dr. J. P. Mathews, Carlinville.

*Obstetrics*—Dr. J. B. Davison, Malone, Chairman; Dr. A. C. Corr, Carlinville; Dr. J. Y. Campbell, Paxton.



*Gynæcology*—Dr. E. W. Jenks, Chicago, Chairman; Dr. G. W. Nesbitt, Sycamore; Dr. F. Cole, El Paso.

*Ophthalmology and Otology*—Dr. A. E. Prince, Jacksonville, Chairman; Dr. W. T. Montgomery, Chicago; Dr. C. Chenowith, Decatur.

*Drugs and Medicines*—Dr. Joseph Robbins, Quincy, Chairman; Dr. T. J. Pitner, Jacksonville; Dr. L. L. Silverthorne, Charleston.

*Næcology*—Dr. E. Ingals, Chicago, Chairman; Dr. W. Hill, Bloomington; Dr. W. West, Belleville.

#### SPECIAL COMMITTEES.

*Relations Between Syphilitic and Non-Syphilitic Lesions of the Skin*—Dr. James Nevins Hyde, Chicago.

*On the Management of Diseases of Children*—Dr. W. O. Mendenhall, Georgetown.

*On Medical Legislation*—Dr. W. A. McClellan, Knoxville, Chairman; Dr. D. S. Booth, Sparta; Dr. W. Hill, Bloomington; Dr. C. Truesdell, Rock Island; Dr. E. Ingals, Chicago.

*On Diseases of the Nervous System*—Dr. S. M. Wylie, Paxton.

#### MEMBERS OF JUDICIAL COUNCIL.

Dr. C. Truesdell, Rock Island; Dr. C. Goodbrake, Clinton; Dr. A. K. Van Horne, Jerseyville.

The next annual meeting will take place at Quincy.

*Delegates to the American Medical Association*, to meet at St. Paul in June, 1882.—Drs. J. H. Hollister, Chicago; W. T. Kirk, Atlanta; W. T. Montgomery, Chicago; G. W. Jones, Danville; E. P. Cook, Mendota; A. Hard, Aurora; R. Boal, Peoria; G. W. Nesbitt, Sycamore; Sarah H. Stevenson, Chicago; J. M. Cowan, Hennepin, W. R. Shinn, Fielding; W. M. Call, Princeton; Catharine B. Slater, Aurora; J. P. Johnson, Peoria; John R. Livingood, Rossville; J. S. Whitmire, Metamora; S. T. Hurst, Greenview; Ellen A. Ingersoll, Canton; D. Lichty, Rochelle; D. E. Foote, Belvidere; D. S. Jenks, Plano; R. G. Bogue, Chicago; T. D. Washburn, Hillsboro; C. Truesdell, Rock Island; A. H. Kinnear, Metamora; David Prince, Jacksonville; E. W. Jenks, Chicago; W. West, Belle-

ville; H. P. Newman, Chicago; D. S. Booth, Sparta; W. H. Fitch, Rockford; Thomas Galt, Rock Island; W. L. Ransom, Roscoe; J. W. Dora, Mattoon.

*To the Wisconsin State Medical Society*—Dr. Roswell Park, Chicago.

*To the Indiana State Medical Society*—W. O. Mendenhall, Georgetown; W. M. Chambers, Charleston.

*To the Ohio State Medical Society*—J. R. Corbus, La Salle; Daniel Lichty, Rochelle.

*To the Michigan State Medical Society*—J. H. Hollister, Chicago; E. W. Jenks, Chicago.

*To the Kentucky State Medical Society*—M. W. Hurst, Sweet Water.

*To the Missouri State Medical Society*—H. W. Morehouse, Danville.

*To the Iowa State Medical Society*—M. A. McClellan, Knoxville; S. L. Plummer, Rock Island.

*To the Minnesota State Medical Society*—B. F. Crummer, Warren.

*To the International Medical Congress*, to meet in London in August, next—Drs. R. N. Isham, Chicago; De Laskie Miller, Chicago; S. J. Jones, Chicago; W. A. Haskell, Alton; David Prince, Jacksonville.

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## ARTICLE VII.

### WEST CHICAGO MEDICAL SOCIETY.

Dr. H. M. Lyman, President, read a paper on the

#### IDENTITY OF SMALL-POX AND COW-POX.

Soon after Jenner's discovery, a Mr. Ceely of England, experimented in communicating small-pox to cows, and after a few re-vaccinations, obtained common vaccine virus. It seems these experiments were ignored by most physicians of the present day. However, the late investigations of Pasteur with chicken cholera threw more light on the subject. Experiments similar to Ceely's had been made in Berlin in 1802. It was remarkable that cow-pox had become so rare since those days. It was not a primary

disease in cows, and must have originated from variolous milkers' hands. No disease had so many forms with different degrees of intensity as variola.

The present theory was the only one which could explain the immunity conferred by vaccinia, for a disease never protected from another disease. Thus anthrax vaccination could be accounted for as well. And in cases of emergency, he advocated originating new vaccine virus by inoculating cows with small-pox. The first vaccine thus obtained would almost have the character of variola, and should be first inoculated in another cow to investigate its intensity. It would be more likely to produce vaccinia with an eruption.

In Jenner's time, vaccination was thought to be a protective for life, and the statistics furnished very few cases of small-pox after vaccination, and obviously during the following seven years. That vaccine virus had partly lost its efficacy in England was a fact, and a time could be calculated when it would become quite innocuous if not renewed. The virus used in this country is of a more recent origin. The mortality from small-pox was less before Jenner's time than it is now. For through a series of ages small-pox, by perpetuating itself in man, had become partly attenuated (the fittest having survived), those whose systems had been least able to resist having died, and a sort of tolerance had been conferred through hereditary descent.

It was probable that variola had a *habitat* in China, or Central Asia, whence most epidemics seemed to have arisen. According to this theory, epidemics would stop after many had had the disease, and many others had obtained a sort of immunity from it through exposure to the epidemic influence. Dr. Lyman's paper is printed in full in this number of the JOURNAL.

#### DISCUSSION.

Dr. Norman Bridge, referred to Dr. Meyer's experiment in this country, by which an epidemic of small-pox had been started from the use of virus originated *de novo* by inoculating a cow with small-pox matter.

Dr. Lyman thought that would confirm the received theory, for a first culture would attenuate the disease only to some degree, and inoculation should have been continued in a series of cows.

Dr. Bridge believed that the first inoculations with vaccine virus had been as mild as later ones; while in epidemics, small-pox began severely in every new center.

Dr. Lyman said that epidemics generally developed in communities which had not seen the disease for a long period, and that a new culture was most virulent in fresh soil.

Dr. Bridge said every person was a fresh soil for the disease, but Dr. Lyman believed that exposure to the general influence of the epidemic seemed to mitigate their predisposition.

Dr. E. W. Lee partly explained the cessation of epidemics by an increased vigilance on the part of the people who soon became alarmed and established quarantines.

Dr. Bridge wished to know how to reconcile hereditary tolerance with small-pox inoculations so extensively used in the British Isles. These generally had the disease in a mild form, and in reckoning them with other cases of small-pox, would give this low percentage of death quoted by Dr. Lyman.

Dr. W. E. Clark remembered the time when small-pox was inoculated to insure immunity afterward; his parents had submitted to the disease. Not more than three or four per cent. died.

Dr. W. J. Maynard said contagious impetigo was liable to follow vaccination; he had seen a few cases.

Some of the members had observed that disease in a few cases, and others reported a few cases of death from vaccination with virus kept for some time, or carried in the coat pocket. It seemed the virus had been thus altered and acted somewhat like septicæmic matter.

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#### ARTICLE VIII.

##### CHICAGO MEDICAL SOCIETY.

Stated meeting, May 15, 1881. Dr. E. Ingals, President, in the chair.

The paper of the evening, on

##### NUMERATION AND MEASUREMENT,

was read by Dr. Weller. He said that the idea upon which the Decimal System was founded was as old as written history; a

Roman scale, constructed as a lever with unequal arms, and graduated in decimals, had been exhumed from the ruins of Pompeii, while unmistakable evidences were found that the decimal scale was applied to measures of length and weight in Egypt in the days of the Pharaohs, in Chaldea, and when the Sanscrit was the popular language of the Hindoos. Ingenious mathematicians have constructed systems based on different radices—four, six, eight, twelve, sixteen, twenty-four and sixty-four. Charles XII of Sweden, constructed one based on twelve. Emmanuel Swedenborg, one on sixty four; but, “man, to whose nature imperfection clings as a part of it, cannot think a perfect thought, much less construct a perfect system.”

He now proposed a system based on the radix eight, which Dr. Taylor, of Philadelphia had discussed before the Pharmaceutical Association in 1859. This new system needed new characters and a new nomenclature. The first eight numbers would be *un, du, te, fo, pa, si, he, ok*. Zero would become *ze*. *Unok* or *nok* would be nine; *nokun*, eleven; *dok*, sixteen, *fok*, thirty-two, etc. A letter added to and preceding one of the numbers becomes a multiplicator, placed after it, it means addition. He did not believe the unit of the decimal system had any advantage over other measures of length, and said that the avoirdupois pound should be retained in this country; but this he proposed to divide according to his new system.

Followed a discussion of the paper by Drs. Whitmire and Ch. Kruzemark, the latter had adopted the decimal system and was well pleased with it.

#### MATERNAL IMPRESSIONS.

Dr. H. D. Valin reported a case of that nature. He had lately delivered a woman of a big boy, and found the child's nose flattened on the right side. The mother said that when she was about three and a half months pregnant, she had entered a meat market where she met a man whose nose had been eaten away by a cancer. It made a strong impression upon her, and there was no doubt in her mind as to its having caused the child's nose to assume such deformity.

Dr. Weller had met a wonderful case of that nature. When three and a half months pregnant, a woman had fallen down a

ladder, and after delivery at full term, it was found that the baby's right leg had been broken below the knee, and that the fragments of the bones had united with a good deal of deformity.

Dr. J. S. Whitmire had seen a case of congenital fracture of the femur, following a tedious labor, but he had not been able to ascertain how the bone had been broken.

Dr. Weller related another case of maternal impression, in which the mother asked him before she had seen her baby, whether it had a white spot on the left eye? She had discovered an artificial eye from the manner in which the light was reflected from it, when in her third month of pregnancy. The child had such a mark and has it yet. He is an employè of the North-Western Railway Co.

Dr. R. A. Leonard said he had in his museum a foetus whose features resemble very much those of a beggar on State street who had come under the mother's observation. Foetus was acephalic and remarkable in many respects.

Dr. Jas. E. Mead was elected a member, and the name of W. H. Curtis proposed.

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ANNUAL death rate per 1,000 in the chief cities of the United States for the year 1880 :

	Population.	Total No. of deaths.	Annual death-rate per 1000.
Boston.....	362,535	8,634	23.5
Providence.....	104,850	2,098	20
New York.....	1,206,577	32,245	26.7
Brooklyn.....	566,689	13,576	24
Philadelphia.....	846,980	17,701	20.9
Baltimore.....	332,190	8,216	24.7
District of Columbia.....	180,000	4,122	22.9
New Orleans.....	216,140	5,631	24.2
Louisville.....	123,625	2,618	21.2
Cincinnati.....	255,708	5,331	20.9
Cleveland.....	160,140	3,260	20.4
Chicago.....	503,304	10,469	20.8
Milwaukee.....	115,578	2,891	21.5
St. Louis.....	350,522	6,725	19.2
San Francisco.....	233,956	4,518	19.3

—National Board of Health Bulletin.



## Domestic Correspondence.

### ARTICLE IX.

#### COMPETITION.

MESSRS. EDITORS:—I indite this article with the hope of calling forth a similar comment from others of our profession. The subject in hand is of vital interest to all physicians and surgeons practicing their calling outside of the classic walls of their medical *alma mater*. I do not wish to cast a stone at any particular college or medical uncle who took our cash for wise instructions, dignifiedly imparted, when we of the common herd were in the embryo state. We always will hold them in remembrance dear, and as long as the learned and skilled professor will remain true to his office of imparting medical lore and absorbing legitimate clinical material, then, so far, I say amen. But, for a man occupying any chair at the shrine where all budding M.D.'s for the stipulated time, pay devotion and cash, for him to descend and compete with his own and the fledglings from other institutions, who, after years of patient study and constant practice, have ripened into able surgeons—this fact is what prompts this article. My revered father and my honored preceptors taught me to heed the established code of ethics, and, until I began active practice, I always supposed that the fountain head of professional ethics was at our medical schools; but when I speak for myself I know personally, that I only echo the same experience for others of the country laity. For example, and to illustrate the workings of competition from high sources backed by the high prestige of a special chair in an established college: I was in the office of Dr. —, in a neighboring town, where a patient presented himself for examination. Case, necrosis of the os-humeri, requiring surgical interference. The doctor was skilled in that branch of surgery, perfectly competent to operate; patient well able to pay proper fee. Patient inquired amount of same,

and he himself set a day for the operation, but failed to appear. I made it my business to ascertain the reason. Found that he had become alarmed, took flight to the city, had consulted the professor, who concurred in diagnosis and was informed of amount of surgeon's reasonable fee for operation at home. Professor deliberately competed and took in the lucre. I was consulted by a gentleman with a diseased optic, case for immediate enucleation. Advised operation, and stated reasons so that patient could understand. He appreciated the importance of the information and set a near day for the operation, but failed to appear. I bided my time, and discovered that some one had advised him *to go to college where they would take it out for nothing*. This patient was wealthy and my fee was moderate. He acknowledged to me afterward, that he had expected to save fee by free operation at the college clinic, but decided not to make a show of himself, and had determined to return to me. When the chair of ophthalmology learned this fact, it bent down to inquire the amount of my fee, deliberately competed, and the lucre was kept out of home circulation.

I could enumerate over twenty cases of recent and more active competition than the above, for I spared no time or expense in order to get at the facts and satisfy myself truly, why consulting cases seldom return from their trip unplucked after crossing the spider's portals. In this manner does the country doctor's *honorarium* become a *non est*. During my last visit to the city one source of amusement was to notice the workings of the professional man from high to low stations, and I find the greed for coin overtops all points that can be strained. I hope all of our able country physicians and surgeons will awake to these facts and consult their own interests by more unanimity of feeling and recognition of each other's worth, and assist each other to combat this tendency to absorb our legitimate cases, especially those inclined to flee to the cavernous maw of the delusive college clinic. Any physician who has had experience at a college hospital where he could get an idea of each professor's private income from pay cases, is aware that a major portion of such income is derived from an unfailing supply of patients from the country. Now too often is it a fact that cases are referred to

professor so and so, in preference to turning the same over to our competitor at home who is perfectly competent to properly attend the same, and who would give closer and more undivided care to the case than the patient could possibly obtain at the professor's crowded clinic. Surely the medical millennium would be at hand if this *odium medicum* could be overcome. At the founding of a medical college one principal card to induce students to attend is the charitable free clinics, and a grand good school it is. The clinic is advertised to be supported by the State and materialized by the abundant paupers. This is the correct and proper source to draw from, for it does not interfere with the income of the special physician or surgeon either of the city or country. But when the free clinic is open to the whole and adjoining States regardless of the ability to pay, of many applicants, then do we gnash our teeth over the loss of that case and the needed fee; also, not to speak of the absorption of the pluckings by the professor at his elegant private office where the sufferer is impressed with the belief that therein is condensed the quintessence and *ultima thule* of medical skill.

Do you not see my dear country doctors wherein lie our grievances? We set our professional hook baited with half a life's hard study; little cases come and nibble, then a big bite. We have the prize half landed (in our mind), when lo, the shark of the college clinic gobbles it up! Let us reform and protect ourselves. If Dr. A. does not feel at home with a case, send it to Dr. B. across the street, who is just the man for the particular case. Do this in order to uphold the dignity and honor of our home and country practice. Please do not consign a patient to the cramped wards of a hospital when they can secure as good services at home, with the benefit of country air and wholesome diet. Every community is blest with a competent physician or surgeon, whose door cheerfully opens at the knock of even the suffering poor. But I had better close this communication for I may have offended some one; if so, I beg pardon, for I have only jotted down a few of my observations on this internal competition and jealousy among our profession, and think it time reform should set in. This article may not meet the approval of every reader, but, *damnante quod non intelligunt*.

Goshen, Indiana.

DR. J. W. LAMBERT.

### Reviews and Book Notices.

ARTICLE X.—A MANUAL ON DISEASES OF THE EYE AND EAR; FOR THE USE OF STUDENTS AND PRACTITIONERS. By W. F. MITTENDORF, M.D., Surgeon to the New York Eye and Ear Infirmary, etc., etc. New York: G. P. Putnam's Sons, 1881.

This book, it seems to us, fulfills the author's promises, as set forth in the preface, better than any other manual of the same character of which we have knowledge.

Addressing itself to medical students and practitioners, and intended to convey to them practical advice and useful information, it is written in plain language and concise form. What we approve of most particularly is the exclusion from its pages of all questions which are still unsettled and under discussion; for their introduction into text books for the beginner bewilders his mind and often causes him to abandon the study entirely.

The ophthalmological part of the work deserves our special and unqualified approval. Nothing of importance is omitted. The symptoms of the diseases delineated in clear and graphic descriptions, the directions for their treatment betray the sound judgment of the expert, and in the prescriptions in which the pages abound, we find those remedies which are valued as useful and efficient by the majority of oculists.

We are very glad to find the author has not joined the ranks of the opposition to the use of silver nitrate in the treatment of blennorrhœal ophthalmia. Our experience, however, would not allow us to subscribe to his statement (p. 92) that "it is not necessary to use a stronger application than a five-grain solution of nitrate of silver once every day." We had strong reasons in many cases to attribute the ultimate success in our treatment to the use of much stronger solutions after that of five grains had been tried faithfully but unsuccessfully.

The colored plates introduced to facilitate the recognition of diseases will, in few instances, fail to accomplish this intention of the author. For instance, fig. 8, marked "conjunctivitis," looks by all means more like the picture of incipient iritis; for its most prominent features are an intense pericorneal redness and a slight irregularity of the pupil. In fig. 10, marked "granular conjunctivitis," the ocular conjunctiva is given the brownish tint it occasionally attains after long continued use of silver (Argyrosis.)

The otological part, which the author added for the convenience of students, is a condensed abstract of Roosa's work on the ear. We think, though, the author could have improved upon the original and enhanced the practical value of his abstract by adding a few lines on post-aural abscesses, and on the early signs of phlebitis of the lateral sinus, the diagnostic significance of which has recently been pointed out by Dr. J. O. Green. Also some information with reference to the relative merits of the ear-trumpets, audiphone, and kindred appliances would undoubtedly be highly appreciated by practitioners, for upon this topic they are very likely to be interrogated by friends and patients.

We are quite certain this book, by its plain, common-sense teaching, will make hosts of friends among medical students, and we hope it will convince them that they may become as competent to treat many diseased ears and eyes as to treat a sore throat, if they only pay as much attention to eye and ear dispensaries as they give to surgical and medical clinics. F. C. H.

ARTICLE XI.—THE SKIN IN HEALTH AND DISEASE. By L DUNCAN BULKLEY, M.D., Attending Physician for Skin and Venereal Diseases at the New York Hospital, Out-patient Department; Late Physician to the Skin Department, Demilt Dispensary, New York. Philadelphia: Presley Blakiston, 1880.

This excellent work is divided into four chapters. Chapter I is a *résumé* of the anatomy and physiology of the skin. Chapter II is devoted to the consideration of the "Care of the Skin in Health." This chapter is a most entertaining and instructive one. In the third section Dr. Bulkley endeavors to "give a gen-

eral idea of the way in which the skin becomes diseased," and "a sketch of the more prominent affections, and the means of their recognition and prevention as far as possible." The last chapter, "Diet and Hygiene in Diseases of the Skin," is filled with sound sense, brief and to the point.

This little book is one of the very best of the series of American Health Primers.

B. W. G.

ARTICLE XII.—CUTANEOUS AND VENEREAL MEMORANDA. By HENRY G. PIFFARD, A.M., M.D., Prof. Dermatology, University of the City of New York, Surgeon to Charity Hospital, etc.; and GEORGE HENRY FOX, A.M., M.D., Surgeon to the New York Dispensary; Lecturer on Diseases of the Skin, College of Physicians and Surgeons, New York, etc. Second Edition New York: Wm. Wood & Co., 1880.

Comparatively few medical men ever become familiar with the *nomenclature* of skin diseases. Only a small per centage of physicians are thoroughly informed upon this important branch of medicine. A considerable knowledge of the Greek and Latin languages, and especially the former, is *essential* to a *thorough* understanding of the vocabulary of diseases falling under the comprehensive term, DERMATOLOGY. No man, who is not fairly proficient in these languages, enjoys being brought face to face with such a word as "Trichophytasis," and to a reader whose knowledge of language is limited to the Anglo-Saxon, the idea of encountering such a word as "Telangiectasis," is anything but enjoyable.

A careful perusal of these "Memoranda" will serve to familiarize the student and practitioner with the names, as well as the symptoms and treatment of the principal diseases of the skin.

However, for a *complete* treatise upon this subject, one must consult other and more exhaustive works.

B. W. G.



## BOOKS AND PAMPHLETS RECEIVED.

- A Treatise on Bright's Disease and Diabetes. By James Tyson, M.D.
- A Treatise on Albuminuria. By W. Howship Dickinson, M.D.
- A Treatise on the Materia Medica and Therapeutics of the Skin. By Henry G. Piffard, M.D.
- A Treatise on The Continued Fevers. By James C. Wilson, M.D.
- Cyclopædia of the Practice of Medicine. By Dr. H. von Ziemssen, Vol. IX.
- Medical Electricity: A Practical Treatise on the Applications of Electricity to Medicine and Surgery. By Roberts Bartholow, M.D.
- The Transactions of the American Medical College. Vol. XXXI, 1880.
- On the Antagonism Between Medicines and Between Remedies and Disease. By Robert Bartholow, M.D., LL.D.
- Dr. Paul Borners Reich's Medicinal Kalender für Deutschland auf das Jahr, 1881. Part II.
- Transactions of the Illinois State Medical Society, for 1878.
- Anatomical Plates. By Ambrose L. Ranney, M.D.
- How we Feed the Baby to Make Her Healthy and Happy, with Health Hints. By C. E. Page, M.D.
- Illinois State Medical Register for 1877-8. By D. W. Graham, M.D.
- The Diet Cure: An Essay on the Relations of Food and Drink to Health, Disease and Cure. By T. L. Nichol, M.D.
- An Introduction to Pathology and Morbid Anatomy. By T. H. Green, M.D.
- The Metric System in Medicine. By Oscar Oldberg, Phar. D.
- Lectures on the Diseases of the Nervous System, especially in Women. By S. Weir Mitchell, M.D.
- What Every Mother Should Know. By Edward Ellis, M.D.
- The Normal Temperature of the Head. By J. S. Lombard, M.D.
- The Diseases of Children; a Practical and Systematic work for Practitioners and Students. By William Henry Day, M.D.
- Medical Register and Directory, being a Treatise on the Diseases and Surgery of the Mouth, Jaws and Associate Parts. By James E. Garretson, M.D.
- Atlas of Human Anatomy, containing 180 large plates, arranged according to Drs. Oesterreicher and Erdl, from their original designs from nature and those of the greatest anatomists of modern times, with full explanatory texts. By J. A. Jeâncon, M.D. In 12 numbers, from Parts 31-42.
- Supplement to Zeimssen's Cyclopædia of the Practice of Medicine. By George L. Peabody, M.D.

A Medical Formulary, based on the United States and British Pharmacopœias, together with numerous French, German and Unofficial Preparations. By Laurence Johnson, M.D.

The Principles of Myodynamics. By J. S. Wright, M.D.

Hygiene and Treatment of Catarrh. Therapeutic and Operative Measures for Chronic Catarrhal Inflammation of the Nose, Throat and Ears. Part II. By Thomas F. Rumbold, M.D.

The Hygiene and Treatment of Catarrh. Part I—Hygiene and Sanative Measures. Part II—Therapeutic Measures. By Thos. F. Rumbold, M.D.

Introduction to the Study of Indian Languages, with Words, Phrases and Sentences to be Collected. By J. W. Powell.

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ALUMNI PRIZE.—The Prize of the Alumni Association of the College of Physicians and Surgeons of New York, of \$500, for an original essay on some subject connected with medicine or surgery, is open only to the competition of the Alumni of the College of Physicians and Surgeons.

The conditions upon which the prize will be awarded are as follows:

1. The subject is left to the option of the competitor.
2. The essay must present sufficient original, experimental or clinical observation to make it a useful contribution to medical knowledge.
3. The essay, designated by a motto, must be sent to a member of the Committee on Prize Essays, accompanied by a sealed envelope, inscribed with the same motto, and containing the name and address of the author, on or before April 1, 1882.

ALBERT H. BUCK, M.D., 109 Madison av.

CHARLES MCBURNEY, M.D., 40 West 36th street.

GEORGE L. PEABODY, M.D., 57 West 38th street.

*Committee.*

## Editorial.

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### GENERAL EDUCATION AS PREPARATORY TO MEDICAL STUDIES.

The following brief paper was prepared for presentation to the meeting of the American Medical College Association, in Richmond, last May. But as a quorum of delegates was obtained only once, and then only long enough to hear the report of the Secretary and elect officers for the ensuing year, no other business was transacted, and, of course, no papers presented for consideration. The subject of preliminary education, however, is of sufficient importance to justify the insertion of what we had written in these pages, though in form addressed to the members of the College Association. It is as follows :

The necessity for a reasonable amount of mental development and discipline, and the advantages to be derived from a fair knowledge of the common branches of education, including the mathematics, physics, and natural sciences, before entering upon the study of medicine, are too obvious to require either argument or illustration.

Yet it is well known to all the members of this Association that a large per cent. of those who enter upon the study of medicine in this country have neither the mental discipline nor the knowledge just alluded to; and only a small number of the colleges enforce any rule on the subject. Of all the defects in our system of educating men for the practice of medicine and surgery, none are greater or productive of more injury to the community and to the profession itself, than this want of preparatory knowledge and discipline on the part of those who enter it. It narrows the field of mental vision; limits the materials for comparison and criticism; precludes the possibility of apprehending

the philosophy or reason for many things, and consequently compels the acceptance of the opinions of teachers and writers without question; and embarrasses every step of intercourse either with professional brethren or with the community. These embarrassments and limitations to the progress and usefulness of individuals necessarily involve corresponding limitations to the usefulness and honor of the profession as a whole. Improvement here at the threshold of the profession, is naturally the first and most necessary step towards the accomplishment of needed improvements in all other respects.

Admitting the correctness of the foregoing statements, two questions of paramount importance demand the serious attention of this Association. First, What should constitute the minimum amount of education required, to qualify a person to enter upon the study of medicine? Second, When, and by whom, should the amount be ascertained and the standard enforced?

In considering the first of these questions it must be borne in mind that true education embraces both mental discipline and the acquisition of knowledge. The first imparts that capacity for thought, analysis, and deduction so necessary for successfully studying the various departments of medical science and art; and the second furnishes the implements or materials for efficient mental action. To acquire the amount of mental discipline here indicated, certainly requires direct scholastic training sufficient to acquire a good practical knowledge of the common English branches, with the addition of algebra, mental philosophy, physics, physical geography, and botany; while the knowledge embraced in these several branches of study may be regarded as an essential prerequisite to a proper study and understanding of the several branches of medical science. Taking the amount of education here indicated as the minimum standard preparatory to entering upon the study of medicine, I come to the second question, namely: When, and by whom should this standard be enforced?

All must agree that the time when the standard of preliminary education should be enforced is when the student proposes to enter upon his professional studies. First, because the mental discipline and knowledge resulting from such prior education are

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necessary to qualify him to prosecute his medical studies with facility and success. And second, because, to permit him to spend three years of time and a considerable sum of money in pursuing professional studies and then reject him for lack of acquirements which he should have had before he began, would be so manifestly unjust as to need no comment. If the standard is to be enforced when the student proposes to enter upon his professional studies, without appealing to legislative bodies, there are only three parties on whom the duty of such enforcement can be devolved, namely: the preceptor with whom the student is supposed to commence his studies—boards of censors or committees appointed by medical societies—and the medical college in which he proposes to receive instruction.

It requires but little reflection or a limited range of practical observation to show, that the relations of preceptor and pupil in medicine, at the present time, are so far nominal or fictitious, and withal so variable in the character and attainments of the parties concerned, that any attempt to obtain the enforcement of a standard of preliminary education by them would be entirely nugatory. An attempt to accomplish something in this direction has been made by some of the State and local medical societies. But the simple fact that the action of such societies, is binding on no one except their own members, and the further fact that one-third, if not one-half of all the practitioners in the United States are not members of any medical society, would render these society organizations entirely incompetent to enforce any general standard of education.

So far as influencing their own members is concerned they may accomplish much, and all their efforts in this direction should be encouraged.

It becomes evident, from the foregoing considerations, that the medical colleges are the only organizations belonging to the profession on which the duty of exacting a proper standard of preliminary education can be devolved with a prospect of success. We have fully arrived at that period of progress when those entering the profession so generally resort to the medical schools for the chief part of their instruction, that whatever conditions are exacted for the admission to these institutions will effectually

reach the whole body of medical students. Hence, if a certain amount of education was agreed upon as the minimum that would be required for admission to registration and attendance in all our medical colleges it would effectually accomplish the object desired. It is only necessary that the faculty and trustees of each college should require all applicants for registration to furnish written evidence either in the form of diplomas or certificates from respectable colleges, academies or high schools that they have a good knowledge of all branches previously mentioned in this paper, or demonstrate their possession of the same by sustaining a satisfactory personal examination before a standing committee of the faculty, elected for that purpose. If this important measure could be adopted and carried into execution simultaneously by all the colleges, or even by all the members of this Association, it would neither alter their relative positions in relation to each other, nor so far diminish the aggregate number of students as to seriously embarrass any one of them; and yet it would cause a rapid improvement in the educational status of the great body of American medical students. This is clearly proved by the experience of the few colleges in which a fair standard of preliminary education has actually been demanded as a condition for admission for a sufficient number of years to test its practical working. In 1875, the faculty and trustees of the Chicago Medical College, which is also the medical department of the Northwestern University, adopted the standard of preliminary education already mentioned in this paper, except that botany was not included, and appointed a standing committee composed of three members of the faculty, to personally examine all applicants for admission to any of the classes in the college, who did not furnish the written evidences of qualification already specified. The same committee has been continued until the present, and has annually performed the duties assigned to it with fidelity. During the first two years a little more than twenty per cent. of all the applications for admission were either withdrawn rather than risk the results of an examination or were rejected by the committee. This ratio has steadily decreased, and the last year only ten per cent. of the whole number of applications were either withdrawn or rejected. This decrease



does not result from any abatement of the preliminary requirements but from the uniformly better qualifications of the applicants, as illustrated by the fact that of the forty-six who graduated in 1875 only ten per cent. were graduates of literary colleges, while of the forty-six who graduated at the last public commencement, March 27, 1881, nearly thirty per cent. were graduates of literary colleges of good reputation, and ninety per cent. of the remainder had received a good academic training. Precisely similar results have followed the institution of admission examinations in the medical school of Harvard University.

President Eliot, in his last annual report, page 33, says, in reference to the medical school as follows: "The examination for admission was first held in 1877; and its good effects were so soon manifested that the faculty were ready, after only three years experience, to add to the requisitions \* \* \* In this university, until the reformation of the school in 1870-71, the medical students were noticeably inferior in bearing, manners and discipline to the students of other departments; they are now *indistinguishable* from other students. A corresponding change in the medical profession at large would be effected in twenty years, if all the important medical schools of the country should institute a reasonable examination for admission." These statements of the President are fully sustained by the facts given in the annual report of the Dean of the medical school for the same years.

The simple truth is, that just so soon as the medical schools of this country establish any given standard of education to be required for *admission* to such schools, all persons intending to enter upon the study of medicine will make the required preparation without the least hesitation. But so long as the doors of the great majority of our medical colleges are open to all who come without the least regard to their general educational attainments, just so long will the evils and embarrassments that now mar the reputation and usefulness of the profession remain without essential improvement.

As stated, however, at the commencement of this paper, the necessity for the possession of a fair degree of mental discipline, habits of study, and actual knowledge of all those branches

usually included in a good academic course of education, as a preparation for entering upon a field of study so extensive and intricate as that of medicine, is too apparent to justify further comment. And I confess to a feeling of disappointment, that, in the framing of the articles of confederation for this Association, one of its first provisions was not an *article* prescribing a matriculation examination of fair character to be instituted by each college as a condition of membership in the Association.

To remedy this great defect, I now propose as an amendment to Article II, of the articles of confederation a fourth section as follows :

"*Section 4.* Each college member shall require of all applicants for admission or registration as medical students, adequate written or documentary proof that said applicants have a thorough knowledge of the English branches including algebra, botany, physics, physical geography, and mental philosophy, or shall sustain a satisfactory examination on the same topics by a competent committee appointed for that purpose. N. S. D.

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THE WARREN TRIENNIAL PRIZE.—The Warren Prize Committee offer a premium of \$400 for the best Dissertation worthy of a prize, upon the following subject:—

"CHRONIC BRIGHT'S DISEASE (parenchymatous and interstitial nephritis). The Nature and Mutual Relations of the Derangements in the Circulatory and Secretory Organs."

Dissertations should be forwarded to the resident Physician, Massachusetts General Hospital, Boston, on or before February 1, 1883.

J. COLLINS WARREN,

*Secretary Physicians & Surgeons, Mass. Gen'l Hospital.*

### Condensations from Late Editorials in the Medical Press.

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NO PREMIUM ON FOLLY.—Not long ago an American physician lost his life from diphtheria contracted in the attempt to clear a tracheotomy tube by sucking it. His act of folly was, in the opinion of some, hardly condoned by its punishment; by others it was lauded as an act of heroism. A recent number of a contemporary relates with satisfaction, that the Albert medal has been conferred upon a young surgeon of England—a Mr. Grie—who applied his mouth to the tube to restore respiration in a similar case. The editor of our contemporary makes this the occasion for some ironical remarks about the want of appreciation of such deeds in “the land of the free and the home of the brave.”

It is a pity, not that there should be this lack of appreciation, but that there should be any exception to it. It is time, indeed, that expressions of admiration for reckless and unthinking acts of folly should stop, and that men who have any influence in molding public sentiment should strengthen the opinion that it is not praiseworthy, but on the contrary censurable, for one to expose a valuable life in the hope of saving one of less value, and tenfold reprehensible when the risk is so enormous and the benefits are so unlikely to be obtained or kept as in the cases we have just referred to. The man who does such things is not brave, he is rash; and, hard as it may sound, the American who lost his life and the Englishman who received the Albert medal were both actuated by idiotic although courageous impulsiveness.—*Medical Times*, April 23.

CONVALESCENT HOSPITAL.—A daily contemporary recently called attention to the case of a poor consumptive, who shot himself after failing to obtain admission to a hospital because of the incurability of his disease. The paper in question takes occasion to refer to the disposition on the part of hospitals to refuse admission to incurables, and casts unpleasant reflections upon the motives which actuate them in so doing. There is no denying the fact that the majority of our hospitals are adverse to admitting incurables, simply for the reason that thereby help would be denied to many other cases which are curable, and which might otherwise die.

What is needed is a convalescent hospital arranged on an economical plan, furnished with the ordinary conveniences of a home, and supplied with medical attendance. No costly accommodations are required, neither would it be necessary that the buildings be situated in the city, on expensive ground. Hospitals could be built on the cottage plan in suburban districts, and be made to a certain extent self-supporting by the light work that could be easily performed by the majority of the patients. It seems strange, in view of the great good to be accomplished by the establishment of such an institution on a sufficiently comprehensive plan, that some definite means have not been taken to that end.—*Medical Record*.

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MEDICAL, AS COMPARED WITH LEGAL FEES.—Whose fault is it that doctors are, as a rule, so poorly paid? Chiefly, it is the fault of the doctors themselves. First, in that they charge so little; second, in that they so seldom bring suits for recovery; and third, in that they detract from the value of each other's service. The gentlemen of the law are not guilty of any of these misdemeanors, and the victim of even an exorbitant fee would as soon think of resisting, defenseless, a whole gang of assailants, as of disputing a bill for legal services.

Doctors, on the other hand, simple, foolish fellows, do not support each other at all when it comes to the matter of fees. They feel insulted when they hear that a fellow-practitioner has received

an unusual fee. They never got that much themselves, and they know their own equal, if not superior skill. A favorite expression of a little envy is to raise the cry on a fellow-practitioner of "high charges." The regulars get the "regular" fees, and the big fees go to the quacks.

Another difficulty in the matter of fees comes from the side of the law. The gentlemen of the law have the highest appreciation of the value of their own precious services, but the lowest of that of medical men. Honorable judges on the bench award to the meanest lawyers for the cheapest kind of service round sums from private or public funds, while skilled practitioners of our art are not even paid for their loss of time. The young fledgling attorney will receive more pay from the city funds for a few days' defense of a vile criminal, by order of the court, than a ward physician in a year for taking care of the honest poor.

When Prof. Charcot received \$9,000 for a consultation, implying a trip from Paris to Moscow, it was thought worthy of note all over the world. Well, we know of a fee of \$40,000 received by an attorney at law in this city, for services in a case unknown outside the city limits. Five thousand dollars were paid to the attorneys, in Covington, for the settlement of an estate of \$210,000, all in personal property, equal to cash, and but one-fourth that sum to the two physicians who swore to three years' continuous service. And yet a third physician, called once in consultation in the case, refused to sign a paper certifying to the correctness of the medical bill, unless the two physicians would declare that every service had been jointly made.

May the day never come—and it never will—when medicine will merit the opprobrium which now rests, in the matter of money, upon the law, but may it come soon when a fairer recompense for service, whose effect upon the mind and body no one but a physician knows, will be granted without a grudge.—*The Cincinnati Lancet and Clinic*, April 30.

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THE ONTARIO MEDICAL ACT.—An American graduate, if we understand the Ontario Act aright, is to make "his education equivalent to that required of graduates in Canadian schools,

passing the same matriculation, and attend the same number of six months' winter courses of lectures." Hence the American graduate, at the end of his three years of college study, of four and a half to five months, plus the period and assiduousness of his study at home during the remainder of each of the three years, cannot enter upon the practice of medicine—whatever his attainments—in Canada, unless he attends a fourth year in some Canada school. Such a law as this would require some of the leading medical lights of the world to go to school again. Think of Marion Sims, Robert Battey, Thomas, Barker, Emmet, Goodell, Flint, junior and senior, Loomis, Sayre, Draper, Dalton, Stillé, Bartholow, Hammond, Hamilton, Mitchell, Wood, Gross, etc., sitting as students in the Canadian schools of medicine!

From the correspondence we have had with doctors of the United States, and which we have seen from Canadians, we are free to say we do not believe any *intentional* discourtesy has been done the regular graduates of the recognized medical colleges of the United States by the *regular* practitioners of the Dominion. Yet, while this may be so, in view of all the evidence we have in hand, we still think there are national professional courtesies between Canada, as well as Mexico, and the United States—courtesies of a character which we have tried to indicate—which should always be observed. If any well-recognized Canadian or Mexican practitioner of medicine comes to the United States to see a patient, whether he be called in consultation or to attend a patient, let the courtesy be extended of allowing that recognized practitioner to come. Or, if the summons of similar character be sent a regularly recognized practitioner of the United States, to go to either of the classes of patients in either of these different countries, let him be accorded the courtesies of the medical profession, at large, throughout the civilized world, without arrest, or even the threatening of arrest by the courts, the police, or any member of the profession.

If such indignities as have, on several occasions been offered "regular doctors" of the United States, are persisted in, it will become proper for the Congress of the United States to enact some self-protective law in the premises. We trust the occasion



for such a Congressional enactment will never occur.—*Virginia Medical Monthly*, May.

The same medical law is enforced in the Provinces of Quebec and New Brunswick. What is needed is a clause in the Medical Act which would allow any foreign graduate of medicine to register, after passing a satisfactory examination before a board appointed for the purpose by the legislature or the medical colleges of Canada.

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THE SOCIAL STATUS OF THE MEDICAL PROFESSION.—It has always been a grievance with the profession in Europe, that its social position has been placed too low. Of the three so-called "learned" professions it ranks the lowest, and it never has pretended to equal the military or diplomatic service. The bar and the pulpit, the sword and the gown, have, in all periods of English history, overawed the medical man.

There is reason in this. The medical man is a manual laborer, a "chirurgion," literally a hand-worker; his proceedings are "maneuvers," works of the hand; his art is that of a skilled laborer whose success lies in his manual dexterity; and his work is none of the cleanest. Another reason is that he is a tradesman. His hand is extended for the shilling which he earns. In this immediate grasping for money, there is believed to be something deteriorating, and so there is.

Not long since, Dr. J. Milner Fothergill excited the intense ire of some of his associates by describing, in a series of letters to an American contemporary, the present low social position of the country doctor in England. In fact his statements were correct.

It is not better in Germany. The physician there is far from holding an equality with even the inferior nobility. It has been a matter of wondering comment that a few have married into the higher classes. Last year Dr. Wilin, an eminent physician of Breslau, married a Princess of Wurtemberg, greatly to the disgust of her relatives, no one of whom, probably, was his equal in education and mental vigor. The celebrated surgeon, Prof. Esmarch, is another of the few instances.

Such examples are extremely rare. Probably it is in France that the distinguished physician obtains the highest social awards. There is a directness about the French mind which seizes the relations of social life more quickly than any other.

In this democratic country of ours such invidious distinctions do not obtain. There are no discriminations against any honest avocation. The man is judged by his merits and the success which they bring him. He gains whatever social life has to offer without difficulty, if he makes it an object to do so. He is little the better for belonging to a learned profession, and certainly nothing the worse. This, we may take it, is the proper light for him to be viewed in.—*Medical and Surgical Reporter*, April 23.

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SMALL-POX IN LONDON.—The fatal cases of small-pox in London, which had steadily increased from forty-three to seventy-seven in the five preceding weeks, further rose last week to eighty-four, and exceeded the corrected average number in the corresponding weeks of the last ten years by thirty; thirty-nine were recorded in the Metropolitan Asylum Hospitals at Fulham, Homerton, Stockwell, and Deptford, six in the Highgate Small-Pox Hospital, and thirty-four in private dwelling houses. Of the eighty-four persons who died from small-pox within registration London, thirty-two had resided in the South, twenty-four in the East, nineteen in the North, five in the West, and three in the Central groups of registration districts. The eighty-four fatal cases included twenty-three of children under five years of age, twenty-four of persons aged between five and twenty years, twenty-six of persons aged between twenty and forty years, and eleven of persons aged upwards of forty years. The number of small-pox patients in the Metropolitan Asylums Hospitals, which had increased from 820 to 940 in the three previous weeks, further rose to 963 on Saturday last. The new cases of small-pox admitted to these hospitals, which had been 224 and 244 in the two previous weeks, were 227 last week. The Highgate Small-pox Hospital contained ninety-five patients on Saturday

last, against seventy-seven and eighty-five at the end of each of the two preceding weeks; twenty-nine new cases were admitted to this hospital during the week.—*British Medical Journal*, April 30.

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THE PLAIN TRUTH ABOUT VIVISECTION.—The appearance of a new bill bearing on its back the names of Sir Eardley Wilmot, Mr. Samuel Morley, and Mr. Firth, and having for its specific object the *total* abolition of vivisection, supplies us with a not unwelcome opportunity of placing our views explicitly before the profession and the public. In short, an occasion has arisen for speaking the plain truth about vivisection, and we shall not shrink from uttering it.

Vivisection is a scientific necessity; and, inasmuch as it is just as idle to try to stay the progress of science as it is to oppose the rising tide on the sea shore, the attempt to suppress this particular mode of investigation cannot be ultimately successful. Notwithstanding the assertions made by men with warm and feeling hearts, it is an incontrovertible fact that nearly all we *know* of the living organism in health and disease has been learned by vivisection, either intentionally performed, or, as the phrase goes, "accidentally" accomplished. Vivisection has been practiced in all ages and countries, more or less extensively. It is the analytical method applied to the study of organic life, just as the demolition of the earth's crust by the geologist's hammer is the analytical method applied to inorganic nature. The fact that the living animal feels is an untoward contingency, but it cannot qualify the major consideration. The dissection of the dead organism is tributary or complementary, and may well be made preparatory, to the dissection of the living body; but in the long run we must find ourselves face to face with the grim truth that it is the *living* body which science requires, and sternly demands, to explore, and which sooner or later she will explore in spite of all the hindrances which sentiment and humanity may throw in her way. If vivisection is totally abolished in this country practical physiologists will have to go elsewhere. The

great bulk of the information which has enabled physicians to treat diseases with new precision in recent years, and which has already led to the lengthening of many useful lives, is the outcome of vivisection. The aim to minimize the recourse to it was humane, the attempt to abolish it altogether is absurd.

The bill before us writes it own epitaph in the seventh clause : "This Act shall not apply to inter-vertebrate animals." If no pain is to be inflicted in the interests of science we must desist from vivisection of every kind. It is a contemptible affectation of pharasaic humanity to take credit for protecting the dog while we allow the frog to be dismembered for our information and advantage. If a more stringent act on this subject were passed to-morrow, the average number of vivisections now performed would not be reduced. The legislative exploit would simply be offering a little additional incense to our national vanity. The operations denounced here would be performed elsewhere; and then, as now, we should hug the comforting sense of superior humanity, while we bid eagerly for the increased information science might gain in her "cruel" quest.—*London Lancet*, May.

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THE "HAMMOND PRIZE" OF THE AMERICAN NEUROLOGICAL ASSOCIATION.—The American Neurological Association offers a prize of five hundred dollars, to be known as the "William A. Hammond Prize," and to be awarded at the meeting in June, 1882, to the author of the best essay on the *Functions of the Thalamus in Man*.

The conditions under which this prize is to be awarded are as follows :

1. The prize is open to competitors of all nationalities.
2. The essays are to be based upon original observations and experiments on man and the lower animals.
3. The competing essays must be written in the English, French or German language; if in the last, the manuscript is to be in the Italian handwriting.
4. Essays are to be sent (postage prepaid) to the Secretary of

the Prize Committee, Dr. E. C. Seguin, 41 West 20th street, New York City, on or before February 1, 1882; each essay to be marked by a distinctive device or motto, and accompanied by a sealed envelope bearing the same device or motto, and containing the author's visiting card.

5. The successful essay will be the property of the Association, which will assume the care of its publication.

6. Any intimation tending to reveal the authorship of any of the essays submitted, whether directly or indirectly conveyed to the Committee or to any member thereof, shall exclude the essay from competition.

7. The award of the prize will be announced by the undersigned Committee; and will be publicly declared by the President of the Association at the meeting in June, 1882.

8. The amount of the prize will be given to the successful competitor in gold coin of the United States, or, if he prefers it, in the shape of a gold medal bearing a suitable device and inscription.

Signed:

F. T. MILES, M.D., Baltimore.

J. S. JEWELL, M.D., Chicago.

E. C. SEGUIN, M.D., New York.

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By the opening of the fourth course of lectures in October next, the Washington Training School for Nurses hopes to be able to rent a building and have a comfortable house for the nurses, where their training may be systematically conducted under an experienced and educated head nurse, and where the lectures may be given by the medical faculty until a general hospital is established, in which the training of nurses will, we trust, be made a legitimate part of its functions. As an encouragement to those who contemplate entering upon the calling of the "trained nurse," they can state that all of their advanced pupils have found in Washington full and remunerative employment even before they had finished their studies, and only consented to assume the responsibility under the most urgent appeal, but they have in every case given satisfaction alike to the sick and the physician in attendance.—*Dr. Toner.*

## SOCIETY MEETINGS.

Chicago Medical Society—Mondays, July 4-18.

West Chicago Medical Society—Mondays, July 11-25.

Biological Society—Wednesday, July 6.

## CLINICS.

## MONDAY.

Eye and Ear Infirmary—2 p. m., Ophthalmological, by Prof. Holmes; 3 p. m., Otological, by Prof. Jones.

Mercy Hospital—2 p. m., Surgical, by Prof. Andrews.

Woman's Medical College—2 p. m., Dermatological and Venereal, by Prof. Maynard; 3 p. m., Diseases of the Chest, Prof. Ingals.

## TUESDAY.

Rush Medical College—3 p. m., Dermatological and Venereal, by Prof. Hyde.

Cook County Hospital—2 to 4 p. m., Medical and Surgical Clinics.

Mercy Hospital—2 p. m., Medical, by Prof. Quine.

## WEDNESDAY.

Chicago Medical College—2 p. m., Eye and Ear, by Prof. Jones.

Rush Medical College—2 p. m., Medical, by Dr. Bridge; 3 p. m., Ophthalmological and Otological, by Prof. Holmes; 3:30 to 4:30 p. m., Diseases of the Chest, by Dr. E. Fletcher Ingals.

## THURSDAY.

Chicago Medical College—2 p. m., Gynecological, by Prof. Jenks.

Rush Medical College—2 p. m., Diseases of Children, by Dr. Knox; 3 p. m., Diseases of the Nervous System, by Prof. Lyman.

Eye and Ear Infirmary—2 p. m., Ophthalmological, by Dr. Hotz.

Woman's Medical College—3 p. m., Surgical, by Prof. Owens.

## FRIDAY.

Cook County Hospital—2 to 4 p. m., Medical and Surgical Clinics.

Mercy Hospital—2 p. m., Medical, by Prof. Davis.

## SATURDAY.

Rush Medical College—2 p. m., Surgical, by Prof. Gunn; 3 p. m., Orthopædic, by Prof. Owens.

Chicago Medical College—2 p. m., Surgical, by Prof. Isham; 3 p. m., Neurological, by Prof. Jewell.

Woman's Medical College—11 a. m., Ophthalmological, by Prof. Montgomery; 2 p. m., Gynecological, by Prof. Fitch.

Daily Clinics, from 2 to 4 p. m., at the Central Free Dispensary, and at the South Side Dispensary.